COMMERCIAL CONFERENCE NUMBER

EDISON BULLETIN

EDISON ELECTRIC INSTITUTE
GEOGRAPHY, RESOURCES & INDUSTRIES
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APRIL, 1942

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EDISON ELECTRIC INSTITUTE

THE ELECTRIC LIGHT AND POWER INDUSTRY

Current Statistical Data Covering 100 Per Cent of Industry

March, 1942

CURRENT STATISTICS

The Electric Light and Power Industry

	March	February	January		December
Generation (000's Kwhr)					
1942	.....	14,084,100	15,645,700	(1941)	15,644,400
1941	13,392,600	12,297,300	13,643,600	(1940)	13,455,900
%	....	14.5	14.7	(%)	16.4
Capacity (kw)					
1942	44,500,000*	44,412,000	44,238,000	(1941)	44,009,900
1941	41,912,000	41,773,000	41,698,000	(1940)	41,638,956
%	6.2	6.3	6.1	(%)	5.7
Peak Load (kw)*					
1942	32,500,000	33,450,000	34,600,000	(1941)	35,100,000
1941	29,700,000	29,900,000	30,800,000	(1940)	31,500,000
%	9.5	11.8	12.4	(%)	11.4
Energy for Distribution (000's Kwhr)					
1942	.....	13,670,000*	15,240,000*	(1941)	15,095,452
1941	12,965,158	11,894,905	13,219,304	(1940)	12,842,218
%	....	....	....	(%)	17.5
%**	12.6	14.9	15.3	....	15.5
Number of Customers					
1942	31,670,000*	31,640,000*	31,630,000*	(1941)	31,607,371
1941	30,545,111	30,468,459	30,404,803	(1940)	30,191,001
%	3.7	3.8	4.0	(%)	4.5

* Preliminary Data, subject to revision
** Percentage adjusted for uniform working days (based on weekly data)

PRELIMINARY CUSTOMER DATA FOR 25 PERCENT OF THE INDUSTRY

(Based on the reported data for 119 companies for which the March data are available and after the necessary adjustments have been made for reported or obvious changes in customer classification, the following table presents the customer data as obtains for these companies for the first quarter of 1942)

	December 1941	January 1942	February 1942	March 1942
Residential or Domestic	5,935,637	5,937,987	5,944,647	5,957,777
Rural (Distinct rural rates only)	106,932	107,422	106,714	107,510
Commercial and Industrial:				
Small Light and Power	920,705	918,924	914,363	912,734
Large Light and Power	33,415	32,323	32,183	32,135
Public Street and Highway Lighting	5,051	5,069	4,983	5,010
Other Public Authorities	24,693	24,645	24,711	24,773
Sales to Railroads and Railways:				
Street and Interurban Railways	33	33	32	32
Electrified Steam Railroads	8	7	8	8
Interdepartmental	133	127	86	91
Total Reported	**7,026,607**	**7,026,537**	**7,027,727**	**7,040,070**

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EDISON ELECTRIC INSTITUTE BULLETIN

Volume 10 APRIL, 1942 No. 4

The Ninth Annual Commercial Conference

Industry Gathering at Chicago Scores Another Success

By C. E. Greenwood

Commercial Director, Edison Electric Institute

WAR is everything Sherman said it was. The producers of that realistic and dramatic motion picture "Gone With The Wind" tried to interpret briefly to the millions who viewed it General Sherman's thoughts. They do make a profound impression. Yet when we compare the engines of destruction in the Civil War days with the mechanized units devised to obliterate humans and property from the face of the earth in this present all-out war of the world, and we close the book of recordings on the chaos these scientific devices achieve in the next two, three or four—perhaps even five years, we will conclude that the Civil War happenings in comparison are in the class of bedtime stories—the Pied Piper and Cinderella. And yet that devastation is just one phase of war.

What Sherman said of war can be said of the adjustments in all business, and specifically in its industrial aspects, to produce these hundreds of thousands of planes, tanks, ships and guns, and to supply the manpower with which to raise havoc with Axis powers in these history-making months ahead. Indications are that readjustment conditions in this conflict will be of greater severity than in any other in history since we are not only supplying our own war machines and mustering human fighting strength for protection of our own territory, but are also the supply depot for every allied nation in armed forces, in equipment, and in food. Market and Distribution problems give way to Production and to Transportation. In the scheme for existence there at once becomes a sharp demarcation between essentials for war and those for civilian maintenance.

It happens that the Home Front is where that intangible "morale" of the people survives or perishes, and enough production must be allocated to civilian use to sustain morale. The spirit of patriotism to cause and country determines what low limits the public will accept. In the U. S. A. we are beginning to feel the initial pinches of restrictions. If we are to "take it" as our ally —Britain—has done, we have far to travel. However, considering the time element in comparing such privations we will no doubt outstrip our English friends.

As the electric utilities are a barometer of business, it follows that they are sensitive to these drastic changes that come about daily in industry, in commerce, and in the entire scheme of living. Someone has said wisely that "Wars are not won by going out of business." All nations have found that to be true. And there must be something more than the so-termed "war business" to keep the nation in a satisfactory condition of economic health.

The greatest immediate problem of the utility became one of capacities and distribution facilities. Demands skyrocketed for electric service loads, particularly in the field of metals and machines for the war emergency. These requirements of generating and distribution created scores of adjustments incident to the supply of service and equipment to the millions of household electrical consumers already affected by war restrictions.

The electric utility plays such a vital role in plans for winning the war, it is essential we martial our forces for effective achievement. Therefore in the spirit of applying our best efforts to supply available facilities and technical skill in this great objective, a Conference was called of the commercial forces of the electrical industry at Edgewater Beach Hotel, Chicago, March 24-26, under sponsorship of EEI. It was the "Ninth Annual" conclave of sales and promotional men. In an announcement letter on the Conference, President C. W. Kellogg said, "I am bringing this Conference to your attention because we should not lose sight of the important commercial aspects in the supply of service to industrial, agricultural and domestic classifications of business where there is a direct bearing on the war effort. An exchange of ideas and crystallization of thought on the methods of maintaining economic stability of our companies, maintaining customer goodwill, and fulfilling an all-out effort for winning the war, is justified under present circumstances."

The wide interest of utility commercial executives, power engineers and others in answering this call, and in obtaining guidance and thinking on the problems ahead was indicated in the registration of 350-odd men and women from all sections of the country during the three-day sessions. Every subject covered in the speaking program was tuned in to the war effort. Among the authoritative speakers were representatives of our Government, universities, manufacturers, utilities and other businesses.

Following customary practice Committee Day was arranged in advance of regular sessions and eight of the organizational committees of the Institute called meetings.

The Industrial Power and Heating Committee, under the Chairmanship of Francis McQuillin, West Penn Power Company, Pittsburgh, Pa., opened up its afternoon session to all utility men for a broad discussion of policies and practices for interconnection of power supply between utilities and isolated plants, and its value in the general scheme for

increasing capacities for production of war materials. There was enlightening and helpful discussion on this subject.

The Farm Utilization Committee under the Chairmanship of F. A. Coffin, Wisconsin Electric Power Company, Milwaukee, Wis., discussed the food production program which had been laid out by government agencies for agriculture. Recognizing the contribution that electricity will make in helping to gain the objectives that have been set, the committee discussed way and means of bringing the farmer's attention to electric labor saving equipment which would contribute to the speed-up of food production.

The Lighting Committee under the Chairmanship of J. E. Mueller, West Penn Power Company, Pittsburgh, Pa., was concerned with the new problems involved through Blackouts, and the effects on the public morale. The educational development of the science of seeing, the part that is played by adequate lighting in eyesight protection, and the direct benefit of light in industrial production for increasing output and contributing to better quality of workmanship were all subjects of the day session of this committee.

How will the utilities help their millions of domestic customers in the continuance of service from electrical servants as requirements for greater conservation of essential metals increase in severity, was the theme of discussion by the committee on *Appliance Maintenance* under the Chairmanship of M. R. Rodger, Middle West Service Company, Chicago, Ill. The answer involves the practice of the theme of OPA in "taking care of the things we have."

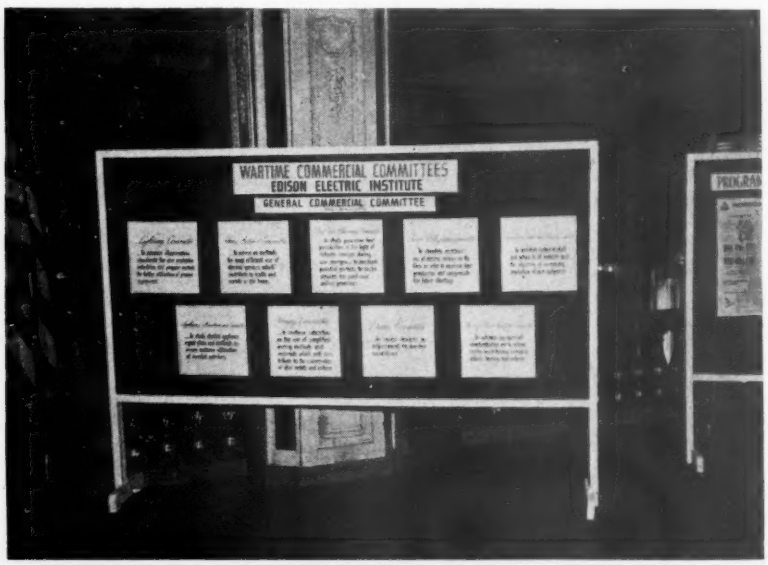
Again the public health is a paramount issue in any war emergency. Nutrition problems have come to the fore in this country as the possibility of food scarcities of different kinds presents itself. Hundreds of Home Service women in the electric utility companies schooled in the fundamentals of food selection and preparation, can be tied into this war effort. The study of these vital needs and educational methods to be followed, engaged the attention of the *Home Service Committee* under Miss Fern Snider, Georgia Power Company, Atlanta, Ga.

The Chairman of the General Commercial Committee talks it over with the Commercial Director

With the building of Defense housing and industrial structures, the demand for essential materials, particularly copper and rubber for adequately wiring occupancies for electric service, has been a major consideration at Washington. For several years the *Wiring Committee* of EEI under G. W. Hart, Ebasco Services, Inc., New York City, has been studying plans for conservation of materials and labor in the wiring field. These possibilities of conservation have had wide test and publicity, with the result that covered neutral cable to help produce these results has been approved on its merits. Recently it was placed number one on the Defense Housing critical list. The Wiring Committee is following through on plans for its educational promotion during the emergency.

Another opportunity for conservation lies in the standardization of electric water heaters. The output of this product has been drastically curtailed except that output will be available for specific applications such as defense housing, and for use in dairies and the like. At time of this writing, stocks of wholesalers and dealers are frozen. However, the *Electric Water Heating Committee* under C. M. Turner, Ebasco Services, Inc., New York City, continued discussion jointly with the manufacturers on this important development.

One of the business adjustments of concern to the entire industry is this dislocation in the scheme of distribution of electric household equipment through mortality of electric dealers. The larger outlets such as department and furniture stores have other merchandise on which to rely for their survival, but the neighborhood electrical dealer has an uncertain future ahead of him. Some are discontinuing their shops and taking their place in defense industry until the post-war period offers new opportunities for broad market development. Others are considering adding supplemental lines or are planning extensive repair work on household appliances. There is no utility that does not have the future of the dealer at heart and the *Dealer Committee* under R. P. Wagner, New York Power & Light Corporation, Albany, N. Y., reviewed the status of the present situation, and is making plans now to



One of ten panels constituting commercial exhibit which defined scopes of committee effort streamlined to the war emergency

Walter Sammis, ex-chairman of the Modern Kitchen Bureau, looks pleased as he reviews the signatures on his scroll with Art Grove (right), chairman of the Plan Committee of the Modern Kitchen Bureau

act as a clearing house for information which will be beneficial to the public, dealer and utility.

Also on Committee Day the *Executive Committee* of the *Modern Kitchen Bureau* met at luncheon. A feature of the meeting which followed was the presentation on behalf of the Manufacturers Committee of a framed illuminated Scroll to W. H. Sammis, Vice-President, Commonwealth & Southern Corporation, in honor of his completion of two years of service as Chairman of the Bureau. He was recently succeeded to that office by Edwin Vennard, Vice-President, Middle West Service Company. The Scroll contained the names of all industry men who had been identified with the progress of the Bureau effort during the leadership of Mr. Sammis. Mr. C. E. Swartzbaugh, Past President of NEMA made the presentation. In addition to the Scroll, Mr. Sammis received a gift of a silver humidor.

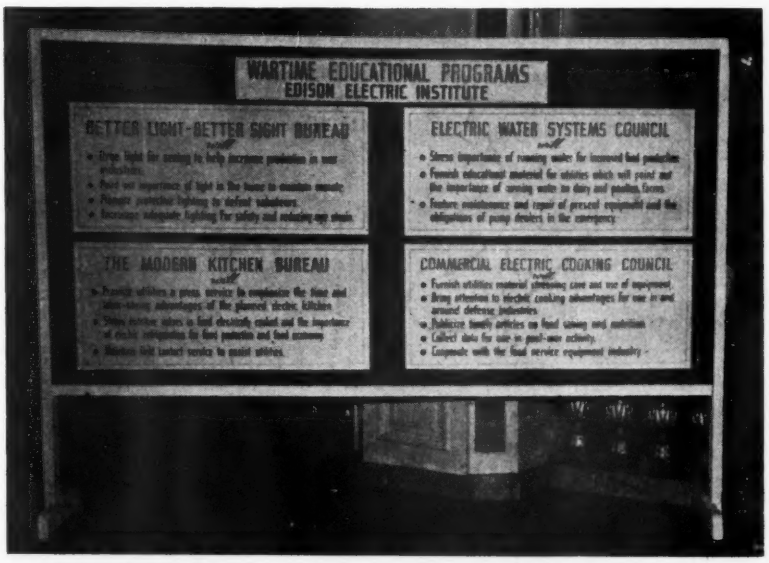
The same evening the *General Commercial Committee* of EEI held a dinner meeting at which National programs and subjects for committee study were presented and discussed. It will be recalled that there was a change in names and scopes of effort of organizational committees of the Institute last July which aimed to center all studies and reports on the war emergency. These plans of organization, together with an outline of copies of committee effort were visualized on displayed panels at the Conference.

The Ninth Annual Conference opened on Tuesday morning, March 24, with a presentation by R. E. Fisher, Vice-President, Pacific Gas and Electric Company, San Francisco, who was also Chairman of the Conference. He was assisted by Vice-Chairman Edwin Vennard of Chicago.

Setting the theme in his title "We're in The Army Now," Mr. Fisher highlighted the questions of moment in the complex situation confronting the industry and the search for solutions to the problems ahead.

Some of the speakers talked from notes, and it is regrettable that no transcript was made, so that the enlightening presentations of Col. M. C. Mapes, Chief, Technical Section, OCD, Washington, R. W. Turnbull, Executive Vice-President, Edison General Electric Appliance Company, Chicago, D. M. DeBard, Vice-President, Stone and Webster Service Corporation, A. L. Scaife, Merchandise Manager, Appliance Department, General Electric Company, and Frank W. Lovejoy, Sales Executive, Socony-Vacuum Oil Company, New York, are not included in this issue of the BULLETIN. Mr. Lovejoy was the final speaker of the Conference. At the Luncheon Session on Thursday, the twenty-sixth, he impressed an inspirational message on the importance of business holding the line although fully attuned to the War Emergency, and stressed the need of men and women retaining their courage in these trying times of adjustment.

In the pages that follow many questions are discussed which are now confronting industry executives who have grave responsibility in this devastating conflict. What cannot be recorded in this outlining of highlights of the meeting are the personal contacts and brass-tack deliberations outside of sessions between men who work far apart, and for whom such a get-together means golden opportunity for help and guidance.



Another exhibit panel which indicated educational material available through national programs.

The Lengthened Shadow of One Man

MR. DOW'S death—with his boots on as he had wished—brought to an end what was perhaps the most brilliant job of bossing a big Public Utility in the history of a great Nation whose annals are replete with accomplishment. Starting as Vice-President and General Manager of The Edison Illuminating Company in July, 1896, he was responsible for more than forty-five years for making those decisions that determine the destiny of an enterprise. It was only during the last two years that, as Chairman of the Executive Committee, his role had been advisory rather than responsible.

It is correct decisions that count. Routine management is important but destinies are molded when two alternatives require a choice between them. It is a boss's job to make these decisions. Mr. Dow realized this. In 1926 he wrote, "Nevertheless if we will progress—indeed, if we are to live—we must make decisions, and we must continue to make decisions, exactly as if there were such a thing as certainty." They may have fine minds and so avoid gross blunders, but in the end a decision is partly intuitive. Mr. Dow's brilliant record of important decisions well made, far in advance of established practice, is outstanding.

• • •

Partly because of his own ideals and partly from his long business experience, Mr. Dow insisted more and more as the years went by that people with whom the Company dealt, customers and vendors and employees, must be treated with friendliness and with fundamental fairness. Time and again valid contracts were modified when unexpected events made them appear unfair; time and again customers who had run into hard luck were released from their obligations. but woe betide the man who tried to take undue advantage of this decency; Mr. Dow's Scotch tongue lashed out at him with a tirade that shriveled the unfortunate wretch in his tracks.

• • •

For more than forty years there was decision after decision — engineering, financial, public relations, rates and labor—important decisions, fundamental to the welfare of the company, made from two to twenty years ahead of final public acceptance; a scintillating string of triumphs. There were mistakes, of course. . . . But the mistakes were few and the correct decisions were many. If you toss a coin you will be right half of the time, but Mr. Dow was right very much more than half of the time, and he was from two to twenty years ahead of the field. This was his great contribution to the Detroit Edison Company.

These successes were not achieved with trivial things. The service offered by the company has become essential to nearly three million people. Mr. Dow has supervised the investment of more than half a billion dollars of other people's savings. And to us, ten thousand of us—men and women and boys and girls—his Company offers a livelihood, through good times and bad; pleasant associations with people we can admire; an adequate outlet for intelligence, ambition and energy. It is granted to only a few men to be principally responsible for such important achievements.

• • •

How was it accomplished? By luck? No—the percentage of accuracy was far too high. By intuition? Perhaps—he claimed, smiling, some acquaintance with the pixies. By high intelligence? Certainly. His was undoubtedly one of the best minds in the nation. By character? Yes! His motto was live and let live. He had no great use for personal wealth—money was something to be spent, freely, joyously. By hard work? Of course. The forty-hour week was for his men—not for him. His appetite for information was insatiable and he had a habit of recording neatly in his little black note book his memoranda of all kinds of facts and information that came to his hand. His mastery of the English language was unequalled, and his writing had a clarity and brevity and charm that could only come from the mind of a man such as he.

He dealt on somewhat better than even terms with specialists in a dozen lines of human thought—he out-figured engineers and out-talked lawyers; he expounded theories to professors and theology to parsons; he fearlessly raided predatory politicians and he out-bargained financiers. Now it is better than even money that he is showing Charon how to row.

• • •

This imposing record of accomplishment, with its undeniable proof of intelligence and ability, may account for the respect but it does not account for the affection with which he is remembered by the ten thousand men and women who make up his staff. After years and years of being praised and reprimanded and lectured and bulldozed by him, a feeling of deep personal loss comes to all of us at his death.

—*From a tribute to Alex Dow, by Harry Snow in the Detroit Edison Synchronizer.*

"We're in the Army Now"

By R. E. Fisher

Chairman, General Commercial Committee, EEI

An address before the General Power Conference, EEI, Chicago, March 24-26, 1942

IT is fundamental at this time that the entire electric industry dedicate itself to two jobs. The number one job is that of "Winning The War" and the number two job "Winning The Peace." Winning the peace is of no less importance than winning the war.

The year 1942 is indeed a critical year for the United States, the American industry and for the electric industry. Every weapon we make today is worth ten that we might produce next year. In a sense, American industry as a whole and the American system of business is on trial and we must again demonstrate to the American people that we can deliver the goods. The electric industry is making, and will continue to make, every effort and every sacrifice to achieve victory.

The most valuable contribution by the electrical industry to this job confronting America and for ultimate victory is organized efficiency. Because of organized efficiency the electric industry is taking a leading part in the number one job of winning the war and we can point with pride to a number of contributions.

First, is the provision of ample power for war production based upon the present outlook. Except for isolated areas, electric utilities served the tremendous new defense loads of 1941 without undue strain. It is significant that the 1941 increase alone equalled the total output of the entire industry 25 years ago on the occasion of World War I. Our ability to absorb this enormous increase resulted in our total generating capacity working an average of only 50 per cent of the time. There are still many more kilowatt hours from existing capacity for customers who will use them when and where available. This is one sound reason favoring war production seven days a week—twenty-four hours a day. On the basis of a $56,000,000,000 defense expenditure in 1943, the increase in electric output over 1941 would approach 35,000,000,000 kwhr, representing an 18 per cent increase. Aside from additional generating capacity to be available, the curtailment of manufacture of civilian goods will release certain blocks of power for war production.

MR. FISHER

A second contribution has been making electricity available quickly, conveniently and economically to all agencies, governmental and others. The organized efficiency of the electric industry has lessened delays, coordinated efficient distribution of new power facilities and demonstrated skill and sound judgment in a highly technical service.

A third contribution to the Nation's war effort is to assist in the most effective utilization of electricity. One example is the "Food for Victory Program" in cooperation with the farmer to make electricity a substitute for labor.

Other examples in furthering the use of electricity include better lighting for industries. This idea, sold by Illumination Engineers, has made possible increased production, fewer scrapped pieces, less accidents and conservation of energy and time. The time saved in one year is estimated to equal that required to produce 2400 big bombers.

Increased production per man hour is one characteristic of American industry that the world has viewed with envy. The electrification of industry has made possible efficient processes for mass production of quality products. The mechanized operation of American industry will enable us to Win a Mechanized War!

Helping sustain civilian morale is a fourth contribution. A continuation of essential electric services means the difference between dreary existence and living on a conservative basis. One problem confronting us is the maintenance and repair of electrical appliances. This is necessary for electrical living even in a limited way. Servicing by utilities should be continued and without discrimination, but dealers should be organized to share in a plan of repair and maintenance work. Utilities should take leadership in such a cooperative service program and not wait for others.

Proper lighting during blackouts is important for sustained civilian morale. Office of Civilian Defense officials have welcomed constructive cooperation by utilities.

Fifth and finally, a most important wartime contribution by the electric industry is rendering the best possible uninterrupted service. Guarding against sabotage is one precaution our industry has taken without publicizing the extent of, or cost of, such work. Preparedness for emergencies during air raids is another step to render service that the industry will be proud of.

Serving in Silence has been our creed. Much has been done on our part and by important war industry customers that cannot be disclosed.

Our number two job is "Winning The Peace." The ultimate purpose of war is peace and "Winning The Peace" means preservation of free private enterprise. The future of the private electric utility industry is contingent on the survival of the American system of business. Our responsibility to win the peace, therefore, is just as important as our contribution toward winning the war. While the electric industry is going all out in step with all other American industries to win this war, would it not seem reasonable to expect all governmental agencies to lay aside their nonessential activities and concentrate their total effort on winning the war? This would remove uncertainties and reassure industry of constructive cooperation.

The efficiency of private enterprise is now being proven in the operation of both war and other industries. The rapid transition of private industry to needs of defense production has astounded the world. The industrial development of the United States and its amazing production capacity is unequalled by any of the totalitarian Axis powers. The efficiency and ability of private industry is being applied by the United States Government to the operation of most of the vast new industries it is creating.

The industrial expansion program of our Government includes doubling and trebling of capacity in many lines, which means the creation of a vast new industrial empire. One phase of this expansion is the War Industries. These are receiving about half of the Government expenditures and generally are operated by private concerns on a lease basis. They include manufacture of guns, shells, warships and munitions of all sorts.

Other industrial expansions largely financed by Government include aircraft, shipbuilding, iron, steel, aluminum, magnesium and machinery. No wonder we ask—after the war what will happen to these plants?

Post war industrial empire possibilities are important to each industry. War time capacity will not be junked. Our new plants are the largest and most modern in history and a large portion can be used for civilian as well as war goods. Who will operate these plants is the question. A continuation of Government-business lease partnership is foreseen for most industries by many businessmen. This forecasts success for the American system of business after the war to create or maintain employment and make low cost goods available to a devastated world. The post war outlook, therefore, is optimistic for productive industry.

In contrast to this the post war outlook for electric utilities presents a challenge. If private utilities prove their ability there will be opportunity for them when V-Day comes. Our destiny, however, is in the hands of our customers. Our obligation is to serve them well. Because of war times our service will necessarily be on a most efficient basis, but it is vital our service always be consistent with good customer relations. We must train our employees HOW to handle customer transactions in a most tactful manner and satisfy the customer despite changed conditions. After all, we impress our customers according to HOW we treat them as much as WHAT we do for them. Let us remember that Good Service is Good Business at all times.

Sales training during war times is not an idle gesture. A sustained program of sales training for both utility and dealer employees will further demonstrate the enterprise and farsightedness of the electric industry. We cannot be prepared to WIN the PEACE without maintaining a sales perspective throughout the war period. One function our sales organizations can materially help with is to maintain personal contacts with customers, especially our important commercial and industrial customers. It is always important that we "KNOW OUR CUSTOMERS." Understanding develops confidence and confidence begets friendship. Thus—sales contacts will foster cooperation with industrial customers and a better understanding of our common problems.

The Edison Electric Institute can contribute to a fulfillment of the responsibilities confronting our industry. For example, by collective effort within our industry a more effective and efficient war-time job can be done to merit a complete endorsement by the customers we serve. It should be the vehicle for telling the public the story about great accomplishments in the electric industry. In addition, we must maintain our national committees and by united effort we can be better prepared for the opportunities that V-Day must bring.

Too much emphasis cannot be placed, at this time, on one fundamental. Private utilities will be judged by their customers according to HOW the war-time job is done, as well as WHAT was done to aid in winning the war. This, in turn, from our viewpoint, may dictate who wins the peace!

The Industrial Power and Heating Committee pause for a moment during a morning session of the committee at the conference. Chairman McQuillan is seen standing in center background.

Maintenance of the National Life

By C. W. Kellogg
President, Edison Electric Institute

An address before the General Power Conference, EEI, Chicago, March 24-26, 1942

AT the present time, and so long as the war lasts, the prosecution and winning of that war is the one predominant issue for every single citizen of the country, and for all its institutions. The simple reason for this is that if this war is not won by the United Nations, nothing else counts or will have any future value. Not only is the war thus the benchmark from which all our thinking and planning and working must start, but it is obligatory upon all of us to make sure that what we do has definite value in working toward the goal of victory. Let us therefore examine our own industry in the light of this criterion.

No one can doubt the essential nature of the electric utility industry in the war effort. Modern war is so much a matter of mechanical equipment, that not only is the bravest group of troops well nigh powerless without its quota of mechanical helpers, but the volume of this help is so great that it has been estimated that it takes 18 persons behind the lines, in mine, factory, transport, etc., to serve one man on the front line. This ratio of noncombatant to combatant forces is much higher this time than it was in the last war, not only because of the much greater mechanization of war, but also on account of the fact that the battle areas now extend all over the globe, with transportation problems of corresponding global magnitude.

Electric power is required for practically every step of this mechanization process. Our industry, which furnishes 87 per cent of the public power supply, is therefore in a way like a great common denominator of all war industries. There is no question about the essential war nature of our industry.

The utility companies, sensing this need and pursuant to requests from the government, have, since the beginning of the Defense effort in June, 1940, greatly increased their orders for additional generating equipment. If we include the governmental bodies, which also contribute to the public supply of electricity, additions of 3,665,000 kw are in the process of manufacture due for completion in 1942, 2,750,000 kw in 1943 and (to date) 1,600,000 kw in 1944. When the orders for this equipment were placed with the electrical manufacturers, the scope of the war program (then only the Defense Program) was about one-third as large as, due to our entrance into the war, it has since become.

For a long time, as any reader of the newspapers knows, the question has been discussed of whether the amount of additional generating equipment ordered would be adequate for the war load. Since Pearl Harbor the demands for greater and speedier output of war material have placed such a strain on the available amounts of raw materials of various kinds that now work on some units of the generating equipment ordered for completion in 1942 has been ordered stopped by the military establishment of the government, because it deems the needs for ships greater than for power. It now seems quite possible that this conflict in needs may cut the new electric generating equipment coming into service this year by as much as a million kilowatts below the amounts ordered, with even greater cuts possible in 1943. The problem therefore with electric power, as with all other national resources, becomes not what we should like to have, but one of making the best possible use of what we do have in the production of what we need for our national safety. It is most fortunate therefore that the utilities during peace times had built up good reserves of power, for all of these may be used to the utmost in the great emergency we now face. In this connection it must never be forgotten that the electric utilities require about eight times as much plant investment per dollar of gross revenue as does the average industrial concern, thus making fixed capital eight times as important to us as to industrials. It raises the question whether, but for the occurrence of the war, the utilities might not have been found to have built up excessive reserve capacity.

At all events, the existing conditions place a great and continuing responsibility on the electric utility companies, to cooperate with our military and naval forces in getting the maximum out of our power generating plant and distribution systems. It will mean much higher load factors, more use of interchange of power between districts, closer schedules on maintenance and overhaul, perhaps rationing of power in some cases during peak hours, training of employees to replace those taken into the armed forces and the development of every possible economy in the operation of the systems. Throughout the history of the industry these consultations among its members (which the Institute fosters) have proved valuable and important and they will be especially so in reaching the wisest solutions of the special problems brought on by the war.

This power conference for all these reasons has not dealt with the same problems it did in past years; but that does not mean that its deliberations and discussions have been any less important or valuable. On occasions in the past it has sometimes seemed in sales activity as though the emphasis was on the devising of new schemes and methods. Now, however, due to the drastic changes that have been thrust upon the country by the war, the problems of adjustment are paramount.

These matters of readjustment affect every part of our business. High taxes, which must be borne by all for the national defense, with their inevitable effect on our net earnings and hence our credit, will place special burdens on the financing of needed extensions. Our engineering and operating forces must tackle the job of getting the most out of our plants but their work must be seconded by active and intelligent efforts by our sales organizations. Sales forces should be so close to their large customers as to be able to work out in cooperation with them effective solutions of the problems of coordinating the maximum use of electric energy with the minimum of excessive peaks. They can also help in the problems that rationing may bring

up—to make the periods of cessation as short and the effects as painless as possible.

All of the foregoing is by way of prelude to what I planned to say on this occasion about the maintenance of the national life. From the very fact that even with all-out war effort such a preponderant part of the manpower of the nation must be exerted in industrial production, it follows that the war effort must be buttressed by a solid civilian foundation; and here again the responsibilities of our industry are great and important.

Let me give you the picture in broad outline. The Defense effort began in June, 1940. Since that time the Treasury Department has been segregating in its daily and monthly statements the amounts spent for National Defense. For the month of June, 1940, the figure was about $200 million. For the month of February this year it was $2,200 million. The amount spent in the calendar year 1941 was $12,400 million. Just what will be spent for the war this year is of course unknown and will depend to a considerable extent on how rapidly new plants can be built, equipped and manned and operating schedules of existing plants expanded, to increase the output of war products. Mr. Leon Henderson, in a talk to the National Farm Institute a month ago, estimated 1942 war expenditures at $40 billion—an increase over 1941 of about $28 billions. This corresponds approximately on a trend basis with the estimated war requirements for the fiscal year ending June 30, 1943, which have been reported to the Congress as the basis for tax legislation.

These are mighty big figures but can be fairly appraised by comparison with the even larger totals of the national income from which, or on the credit of which, they are to be paid. In 1941, for example, figures recently released by the U. S. Department of Commerce give the national income in that year as $94.5 billion, so the war expenditures in that year, large as they were, comprised but 13 per cent of the national income and in 1942 will be about 40 per cent thereof.

This still leaves this year 60 per cent of the national income that will be represented by civilian activities. Not only is this balance of civilian activity large in itself, in that it alone is as great or greater than the whole country showed during each of at least five of the last eleven years, but also it is this remaining 60 per cent that alone must support the huge taxes, and even greater borrowing credit, for carrying on the nation's war effort. The maintenance of a strong, vigorous civilian background is absolutely necessary for the preservation of our nation in this time of supreme test.

Let me repudiate in the most emphatic way the idea that this is a plea for "Business as Usual." All of us realize that, with the concentration of the nation's effort on the war, requiring such drastic rationing of many raw materials as to shut down thousands of industries and completely transform the work of some of our largest, it is foolish even to talk about business as usual. Business has already been drastically changed, and will be more and more affected as the war progresses; but life for every citizen goes on. People must be fed, housed, clothed, warmed in winter, transported to and from work, given medical care and the thousands of details connected with these basic needs—all must be supplied after a fashion if the the entire polity is not to collapse. Into this complicated fabric of national life and activity electricity is interwoven throughout.

It is not therefore for "Business as Usual" that I am speaking, but for the *un*usual. Our job is to adjust the essential service we furnish to the new conditions the war has already produced and which in future to a growing extent will increasingly intensify. We used to count confidently on obtaining any materials or equipment we were able and willing to pay for; now we are limited in what we can get. Formerly our sales were limited only by the energy and ingenuity of our sales forces and public purchasing power; now, even service extensions have to be drastically restricted and much electrical equipment normally obtainable in great volume is no longer allowed to be manufactured. Similarly, many of our operating practices and methods, which had become practically routine, have now to be worked out along novel lines. There probably has not been a time for a generation when so much ingenuity and originality and planning were needed in our business as right now.

Another striking indication of the relative size of this basic tide of national life was furnished by experience in the recent depression. In the darkest year of that period the problem was the exact reverse of the present feverish industrial activity. Now, the demand for materials is so great that it cannot be supplied; then, there seemed to be no demand for much of anything. Yet the record shows that when, at its lowest year, unemployment figures averaged 12,740,000, the number that *were* employed, to carry on the fundamental life of the people, was over 38,000,000. That is, allowing for a minimum number of unemployables, over 80 per cent of the labor force of the country was at work even in the worst depression year.

The figures of our own industry during the year 1933 not only confirm the persistence of a minimum volume of national life, but demonstrate the intimate way in which our electric service is bound up with it. To make the contrast as sharp as possible, I am comparing the boom year 1929 with the bottom year in the succeeding depression, 1933. Between those years energy sold to industry dropped over 21 per cent. Commercial sales, representing as they do a substantial element of continuity in national life, fell off only about 11 per cent. But residential sales, being closely wrapped up with the fundamentals of day to day life, increased 20 per cent. Since the latter was accompanied by a gain of less than 1 per cent in average number of residential customers, we must in fairness attribute the result to the demonstration by our sales forces to our customers that the poorer they might be the more electricity meant to them in the home. That this educational process has continued during the eight years since the depression is evidenced by the fact that the average use of electric energy per home has grown by a further 61 per cent in that period.

With the virtual cessation for the duration of the war of manufacture of the major household electrical apparatus, anything even approaching the huge sales of such equipment as the last two years have witnessed in this country is obviously a thing of the past. However, for the maintenance of the sustained stream of national life we have a major task for our commercial forces. For this purpose public health and morale are vital elements. Both are dependent in large measure on electric light, preservation of food and the saving of human drudgery in the home for use in the war effort. Comparative lack of new equipment gives new importance to the upkeep of existing apparatus. The longer hours

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What Is Expected of Agriculture During the War Emergency

By Sherman E. Johnson

Head, Division of Farm Management and Costs,
Bureau of Agricultural Economics, U. S. Dept. of Agriculture

An address before the General Power Conference, EEI, Chicago, March 24-26, 1942

I AM glad to have an opportunity to meet a group whose history is replete with invention and development of devices bringing greater efficiency and comfort to farmers and city folk alike. The rapid spread of electrical machines and appliances on the farms of this Nation is a good indication that you and I have many common objectives, many of which are vitally concerned with the success of our present war effort.

In this war, the farmers of the United States have been allotted the tremendous job of furnishing a large share of the food and fibers needed to keep *our* manpower and that of the other United Nations producing and fighting until the day of victory. In addition, stock piles must be built to insure continued supplies today and to aid in the vast job of post-war rehabilitation tomorrow—feeding the starving survivors of the conflict in Europe and Asia until their own production can be resumed. Your organization has a definite part to play in this farm program, because many badly needed commodities depend to some degree on electrical equipment, and *especially on service and repair of equipment now in use*. For example, the greatest quantities of milk and eggs are produced in areas where farm electrification has made its greatest advances. There is allotted to the northeastern quarter of the United States more than one-half of the total milk production and almost one-half of the egg production for 1942. Incubators, brooders, milking machines, milk coolers, light, and power all are dependent to some extent on electricity and upon what you and your colleagues have done with electricity. Their proper combination in the production of food is an important factor in our war plans.

Food and war have been associated in many famous ways. I believe Napoleon once said that an army fights on its stomach, and he was not thinking of the guerilla warfare that has so pestered our 20th century aggressors. Washington's

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pleas to the Continental Congress from Valley Forge are well-known history. Today, the world is engaged in the greatest conflict of all time and, as Secretary Wickard has said, " . . . Agriculture is in the front lines. We're engaged in producing the rock-bottom essential of defense. Without our production, there can be no other production."

As a weapon of war, I seriously doubt that food has an equal. The stamina and courage demanded by an extended conflict cannot be maintained unless adequate supplies of a variety of foods are available. In Europe today, starvation is a tool used by Hitler to keep conquered countries in an apathetic state of subjugation. Fortunately for us, the Axis powers themselves are probably already feeling the debilitating effects of inadequate diets. What is more important, this effect will increase, as a cereal and potato diet inadequate in amount replaces the milk, cheese, eggs, and cereals of the past.

This particular point has not yet been pressed as yet, but I can assure you that it is not by accident that our farm program stresses the production of animals and animal products. Such a program is more costly, because our stomachs could be more easily filled by cereals and potatoes. However, nutritionists have discovered food elements in animal products that can be obtained in no other way. Some of these elements are as unknown basically as electricity, but their effect in added vigor and stamina have been proved.

One word of warning. Our advantage in food production cannot make much immediate difference in the war picture, if for no other reason than the starvation diets being endured by fellow members of the United Nations which we cannot yet relieve because of shipping difficulties. Also, of all the groups in the Axis populations, the armed forces are fed the best.

Just what is agriculture doing to meet these demands for more and better foods? More than a year ago, farmers began to step up the production of many products needed in what was then the "defense" effort. Prices for milk products and meats especially had already improved sufficiently to induce some increase in production before we started our production goals campaigns. But just about a year ago Secretary Wickard asked farmers to step up pork production. Feed-pork price relationships have remained favorable during the past year, and hog production is now geared to set an all-time record in 1942.

Last summer, the Department of Agriculture organized one of the greatest jobs of production planning ever undertaken. By adding up estimates of needs for all farm products in 1942, goals were set for the production of what will probably approximate 13 billion dollars worth of food and fiber. This is more than twice the dollar value of the 1939 production of electrical machinery, plus automobiles and auto equipment. After Pearl Harbor, we revised our estimates of 1942 needs, upward in every case in which a change was made. [Table 1 gives the 1942 goals or expected production by products in comparison with

1941 production.] Our plans now call for 125 billion pounds of milk, or roughly more than a quart a day for every man, woman, and child in the United States plus a pint for every resident of the British Isles; also approximately 50 billion eggs, 83 million hogs slaughtered, and other items adding to a record total production 19 per cent above the average for 1935-39.

Some commodities are needed so badly that it is impossible to set feasible goals that will meet our needs. You know as well as I that Japan has cut us off from valuable supplies of fiber, oil, drugs, spices, and, of course, rubber. Some, if not all, of these items eventually can and will be grown somewhere on this hemisphere. In 1942, in this country we will plant land to peanuts, soybeans, and hemp in quantities never thought of until recent months.

An extremely interesting change has been our shift in outlook toward the "surplus" crops of a year ago—corn, wheat, tobacco, and cotton. After Pearl Harbor, every one of these crops assumed new significance. We are going to use our stocks of corn and wheat to feed livestock and possibly divert some to industrial alcohol plants. Tobacco consumption has increased tremendously, as it did in the last war. And, long-staple cotton has become a necessity along with the oil produced as a by-product from the seed. *Thus with the exception of short-staple cotton, wheat for food uses, and some dark tobaccos, every farm commodity in the country will be needed in increasing amounts in 1942 compared with 1941.*

Table 1.—1942 Goals for Agriculture, with Actual Acreage or Production in 1941 for Comparison

Commodity	*Unit*	*1941* *Thousands*	*Goal desired or expected in 1942*[1] *Thousands*	*Goal as per cent of 1941* *Per Cent*
Milk	Pound	115,770,000	125,000,000	108
Eggs (incl. non-farm)	Dozen	3,728,000	4,200,000	113
Chickens	No. slaughtered	585,000	644,000	110
Hogs	do.	72,500	83,000	114
Corn	Acre	87,164	92.5 to 95,000	108
Cotton	do.	23,250	25,000	108
Wheat	do.	62,400	55,000	88
Tobacco				
Flue-cured	do.	732	843	115
Burley	do.	357	383	107
Other domestic	do.	261	272	104
Rice	do.	1,245	1,320	106
Sugar cane	do.	265	(No acreage restrictions in 1942)	
Sugar beets	do.	775	....	....
Dry beans	do.	2,304	2,600	113
Dry field peas	do.	384	665	173
Canning peas	Case	28,700	38,000	132
Canning tomatoes	do.	31,430	40,000	127
Farm gardens	Number	4,800	5,760	120
Turpentine	Barrel	285	450	158
Rosin	do.	950	1,500	158
Cover crop seed	Acre	265	415	157
Soybeans	do.	5,855	9,000	154
Flaxseed	do.	3,367	4,500	134
Peanuts	do.	1,964	5,000	255
Cattle and calves	No. slaughtered	25,905	28,000	108
Sheep and lambs	do.	22,630	22,900	101
Wool	No. shorn	48,900	51,200	105
Turkeys	No. slaughtered	32,500	35,750	110
Oats	Acre	39,363	40,000	102
Barley	do.	15,080	16,000	106
Rye	do.	3,500	3,550	101
Grain sorghums	do.	9,397	10,000	106
All hay	do.	71,893	72,000	100
Potatoes	do.	2,793	3,060	110
Sweet potatoes	do.	843	850	101
Fresh vegetables				
Commercial truck	do.	1,680	1,840	110
Market gardens	do.	1,065	1,075	101
Canning vegetables	Other than peas and tomatoes, about same as in 1941.			
Fruit	Production about as in 1941; emphasis on efficient use.			
Hay crop seed	Acre	3,923	4,919	125
Lumber	M. bd. feet	32,500	33,600	103
Pulpwood	Cord	14,300	14,300	100

[1] Upper group are desired, with incentive provided. Lower group are expected according to present prospects.

From "Production Goals for Agriculture in 1942," prepared by the Office of the Secretary of Agriculture, Feb., 1942.

Farmers of the United States are better equipped to meet these unusual demands than at any time during the past 30 years. In 1941, total agricultural production for sale and use in the home, even with fewer workers on farms, was about one-third higher than it was during 1910-14 and nearly one-fifth higher than during World War I (table 2). Increased production per worker has been even more pronounced, and now averages over 50 per cent more than in the 1910-14 period. And the end is not yet in sight. For with farm workers going into the armed service and into industry, and with agricultural production on the increase, production per worker will go still higher, although this will require longer hours of farm work and probably a better distribution of our available agricultural workers.

A major factor has been the increase in farm mechanization which is pretty well represented by the following change in the number of tractors, motortrucks, and automobiles on farms: In 1940 there were 1,545,000 tractors on farms compared with only 246,000 in 1920; 1,047,000 farm motortrucks compared with 139,000; and 4,144,000 automobiles compared with 2,146,000. Currently, it is estimated that there are about 1,800,000 tractors on farms, 1,050,000 motortrucks, and 4,200,000 automobiles—all constituting the greatest aggregation of mechanical farm power in the Nation's history.

The American farmer of today has a larger power unit, his implements and machines are larger, and the rate of travel faster than was the case 20 years ago. Equipment has steadily increased the efficiency of labor, as multiple-row implements and many useful gadgets have come with the tractor. The two-row corn picker, improved planters, small combines (the combine itself was not widely used before World War I), windrow pick-up balers, beet lifters, and many other mechanical aids have found a place in American agriculture. Considerably less labor is now used for producing most of our agricultural crops than was used during World War I.

During the last 20 years there also has been a decrease of about 11 million head of horses and mules on farms, and 1.5 million head in cities. Thus, mainly by a switch from horses and mules to the use of tractors, trucks, and automobiles, along with other labor-saving farm machinery, farm labor is no longer needed to produce 40 million acres of crops

Table 2.—Trends in Farm Employment and Production, Crop Acres, Workstock, and Motor Equipment, on Farms, 1910-41[1]

Item	1910	1920	1930	1940	1941
Employment in agriculture[2]	100	94	93	87	85
Total production for sale and use in the home[2]	100	108	120	132	136
Production per worker, for sale and use in the home[2]	100	115	129	152	160
Acres of crops harvested (millions)	329	360	370	343	346
Numbers of horses and mules on farms, Jan. 1 (millions)	24	26	19	15	[3]14
Tractors on farms, Jan. 1 (thousands)	1	246	920	1,545	[3]1,800
Trucks on farms, Jan. 1 (thousands)	—	139	900	1,047	[3]1,050
Automobiles on farms, Jan. 1 (thousands)	50	2,146	4,135	4,144	[3]4,200

[1] Estimates prepared by the Bureau of Agricultural Economics. See The Agricultural Situation, Feb. 1942.
[2] 1910 figures, pre-war years, 1910-14 = 100; 1920 is average for war years, 1917-20; 1930 is average for 1928-32; 1940 is average for 1939-41.
[3] January 1, 1942.

previously used for the maintenance of workstock used largely for farm power. What has really happened is that the farmers now sell a larger proportion of their production and buy more equipment, gasoline, and oil, instead of using their labor to produce feed for workstock.

Contributing to increased agricultural production per worker are the increased yields of several important crops. Soil-improvement practices, including a more extensive use of legumes, lime, and fertilizers, and the use of improved varieties and strains of seeds and plants have been factors in this increase. The greater use of only the better lands in some cases where crop acreages have been decreased has also resulted is higher average yields per acre. Improvements in livestock and production techniques have also helped to increase production per worker. These changes in themselves have stimulated the development of new machines and equipment.

The present farm plant is well equipped for heavy agricultural production. It can continue for some years to produce large supplies if farm machines and labor are not unduly depleted. With restrictions now placed upon the manufacture of farm machinery it is highly desirable for farmers fully to coordinate the use of machinery and labor supplies available in the neighborhood and to extend the working life of machines by proper and timely repairs.[1]

In the absence of restrictions on new machinery purchases, 1942 would have added substantially to farm mechanization, because prospective labor shortages, accompanying increases in wage rates, and currently high farm incomes all would stimulate farmer purchases. In addition, production needs of 1942 represent adjustments in many areas to new enterprises demanding some new equipment. Substantial need is evident in these adjustments for more combines, peanut pickers, haying equipment, milking machines, and several other items of mechanical equipment. Great as this demand may be, the unprecedented need of scarce materials in still more essential war industries determines the practical limit of farm equipment production in 1942.

The importance of agricultural products in the war effort has been recognized by Government officials in their priority ratings on farm machinery. These ratings have been made with the intent of meeting the minimum requirements for new machines in the Food for Freedom campaign. The 1942 proposals as a percentage of 1940 quantities manufactured were released by the Office of Production Management (now War Production Board) on Dec. 28, 1941. The percentages ranged from 0 for steel wheelbarrows and portable corn cribs to 353 per cent for windrow pick-up hay balers. The whole list averaged 80 per cent of 1940. On the whole, electrical equipment was given relatively high allocations. For example, lighting plants of 300 watts or less were set at 93 per cent of 1940, while larger plants were set at 118 per cent and electric fence controllers at 120 per cent. Repair parts for nearly all types of machinery are to be produced at levels necessary to meet farm needs.

Even though the manufacture of many pieces of equipment will be limited, the situation is not quite so dark when one considers the vast backlog of machinery and equipment that has been built up in recent years and, too, the *selective* manufacture of badly needed farm equipment that is now taking place. Past experience indicates that purchases of new machines can be cut down very considerably for one or two seasons if the existing inventory of farm machinery is fairly adequate. For example, purchases of new machinery in 1932 dropped to one-fifth of the purchases in 1929 as a result of greatly reduced farm income. But farmers had made liberal purchases of machinery in the period 1925-30, and therefore entered the depression period with a fairly adequate inventory. In the past six years, farmers likewise have made large purchases of machinery. For example, over one-half of the tractors now on farms were purchased within the last five years. Farmers will start operations in 1942 with a fairly adequate farm machinery inventory, but their situation will be entirely different from 1931-33 in other respects.

Instead of workers piling up on farms because they could not find other employment, serious labor shortages are likely to develop in some areas in 1942. There were fewer farm workers in 1941 than in 1940. The downward trend is expected to continue at an accelerated rate in 1942. At the same time, national production goals call for increases in production resulting in a total volume of agricultural products averaging 119 per cent of 1935-39. Compared with 1941 about 300,000 additional man years of work are needed to produce the increased volume called for by the 1942 goals.

Briefly then, farmers in 1942 are expected to set production records in spite of several handicaps. We are already three months along in our calendar year and some obstacles to the attainment of full production are already developing. The most difficult one to handle satisfactorily will be the labor shortage. But somehow the job will be done and farmers will make their full contribution to the war effort.

[1] The preceding discussion centering around table 2 is adapted largely from "To Win This War, Part II," by M. R. Cooper and A. P. Brodell, The Agricultural Situation, Feb. 1942, and from "Tractors Don't Eat Oats," by A. P. Brodell, Land Policy Review, Aug. 1941.

Maintenance of National Life

(*Continued from page* 120)

of night operation of factories for war output makes adequate illumination of much greater importance and value than it was before.

Many of the men in our utility systems have already been called to the colors on land and sea and in the air and many more will be so called before this life and death struggle is over. Let us who remain on the job devote ourselves, with all the energy and resourcefulness of which we are capable, to the maintenance for their support of a strong, healthy home and community life as the most effective contribution we can make to this great enterprise.

Helping the Dealers to Help Themselves

By S. P. Vecker

Vice President, Carolina Power & Light Company

An address before the General Power Conference, E.E.I. Chicago, March 24-26, 1942

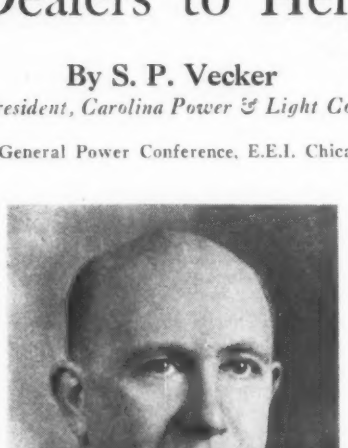
FOUR years ago I spoke before the Institute here in Chicago. My 1938 assignment, "This Era of Dealer Cooperation," afforded me a real pleasure. It was a subject which required no theorizing, for every phase of my remarks was supported with the type of evidence that is comforting to any speaker . . . but, that was four years ago!

In those days such terms as "priorities" and "restrictions" were in no way associated with the manufacturing, distributing, and selling of electrical appliances and equipment . . . and, the word "ration" was solely confined to edible products. It was a time when the mention of Pearl Harbor would have evoked the question "Who is she?" . . . Singapore would have elicited memories of soothing Singapore Slings, and Java meant just another mug of coffee.

There has been much water over the dam since that time.

With drastic changes taking place in such fast and furious fashion, it would seem that past policies, programs, and procedures are of little or no value in planning to cope with today's problems. However, such is not the case. A careful appraisal of the results of our efforts in attempting to establish electrical dealers on a sound merchandising basis will reveal that basic policies may remain the same—that a wealth of trained manpower is available—that we have established relationships founded on the bedrock of confidence—that we have channels of communications and procedures on which any new program can be built quickly. Our task today, therefore, is not one of junking a plan which worked successfully under pre-war conditions, but one of changing the emphasis from the promotion of merchandise sales in ever-increasing volume, to helping the dealer adapt himself to new conditions in order that he may remain in business. This viewpoint, no doubt, influenced the program committee to title my assignment "Helping the Dealers to Help Themselves."

True, the utility industry was largely instrumental in establishing new and numerous outlets for electrical merchandise; yet, it is not expected that the utility alone will be able to produce a plan which can offset entirely conditions with which the dealer finds himself engulfed.



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Today is not the time for peppery pronouncements nor caustic criticisms concerning the bitter basic causes of the dealer's dilemma nor for wistful wishing, day dreams, nor dilly-dallying. . . . Today is a time for timely thinking, definite decisions, audacious action, and level-headed leadership — k e e p i n g in mind that our first and foremost job is to win the war, realizing full well that neither we nor the dealers can hope to escape the sacrifices which everyone will be called upon to make before that goal can be achieved.

The well-being of the electrical dealer has a direct influence on the well-being of the electrical industry. For that reason, I am prompted to refer to the importance of the industry's leaders knowing WHY we should help keep a substantial number of the dealers in business.

I am sure that if we *know* WHY, we shall be inspired to do everything possible to help the dealers stay in business.

May I illustrate the WHY as it applies to my Company?—the WHY which prompts every fellow-employee to enlist in a program aimed at aiding the dealers to stay in business. During 1941 more than eight million dollars' worth of domestic and commercial electrical merchandise was sold in our territory—97 per cent of which was supplied through dealer outlets. That is the WHY!

It then is quite natural for me to ask, "What is it worth to my Company to have a group of sales allies actively promoting, financing, and servicing utilization equipment which reflects several hundred thousand dollars in increased annual revenue?" With no hesitation my answer is, *"it is worth mustering into active service the very best thinking and the maximum efforts from every manufacturer and distributor serving the area, as well as the entire personnel of my company for the purpose of helping keep these sales people in business throughout the emergency."*

Our Company considers its relationship to its associated dealers as one of paramount importance, and is earnestly endeavoring to uncover sound, practical methods of assisting them to remain in business. Now, in the face of a crisis, such as that which looms before us, I certainly feel that a very definite moral obligation exists for us all—manufacturer, distributor and utility—to assist the dealers in solving their problems—to change with the times—so that they may remain in business.

Let us not deceive ourselves by an attitude that the help we today give our dealers is predicated upon an unselfish spirit of brotherly love. When hostilities cease, the conflict will stop with the suddenness of a bolt from the blue. It will be only a matter of weeks between the pell-mell rush of war-time production and the painful process of post-bellum readjustment to peace-time production. The demand for electric power by military establishments and defense industries, which among many utilities will exceed their total peace-time load, will not merely drop—it will tumble—yes, demand will drop more swiftly than

a downward swoop of the fastest dive bomber . . . and where will we be?

With a surplus of power far greater than we have ever had before, we must retrace our steps and start all over again in the upbuilding of domestic and commercial loads. This will require intensive selling on a scale hitherto unapproached in aggressiveness and persistence. When this happens, a most perplexing problem arises if we, through lack of effort and planning, have failed to help our dealers stay in business. Those who look upon today's problems with indifference, believing that dealers easily may be reenlisted whenever the need arises again, likely will hear a refrain from that group which will bring to memory an early song hit entitled, "You Didn't Want Me When You Had Me, So Why Do You Want Me Now?" And perhaps, the same spirit which prompts the neglected maiden in the song to spurn her lover, may describe the attitude of neglected dealers who have been invited by indifferent utilities, distributors, and manufacturers to return to the fold.

Unless we make an earnest and reasonably successful effort to help keep as many dealers as possible in business, we may expect the time to come when we shall have to go back to the costly, inefficient methods of doing all the merchandising ourselves, which will mean large inventories and a considerable increase in cost for manpower, sales promotion, and advertising.

And, too, there is a very definite obligation to those whom we serve. Thousands of customers may become critical and disgruntled if there is a disintegration of the dealer organization, thereby making it difficult and costly for these customers to keep their appliances in proper repair and serviced for good operation. And, I feel safe in saying, that there are not many of us who would want our companies to assume full responsibility for servicing the entire equipment now in use among our customers.

For the sake of our dealers, for the sake of our customers, and for our own sake, we must wake up to the seriousness of the situation. I have no panacea to prescribe that will give you specific directions which will lead you unscathed through this "wandering in the wilderness" period. All that I can hope to do is to outline the trend of my thoughts in seeking a solution to this problem, as it presents itself to us in the Carolinas.

Two years ago when the first dark shadow of uncertainty began to cloud the appliance horizon, our sales department made a detailed survey of all dealers throughout the territory, and, at that time, concluded that the future of a strictly all-electric dealer, in a territory such as ours, was not pleasant to contemplate. From that moment on, our efforts have been directed toward the discouragement of new dealerships of an exclusive electrical merchandising nature, and the encouragement of existing dealers to strengthen their positions by the adoption of non-conflicting, yet kindred, lines of merchandise. The wisdom of our work has already been proved as the future of the electrical merchandise business has grown more and more uncertain.

Our next step, in anticipation of new shortages in many lines of electrical appliances was the complete curtailment of our own major appliance merchandise activities. It was felt that as shortages of merchandise increased, our associated dealers were entitled to priority over the utility in the purchase of such goods as might be available, and also, entitled, to make the profit from as many sales as could be made in our territory.

Today, my Company's sales rooms with the exception of lamp bulbs and a very limited selection of table appliances and lighting adapters, are practically barren insofar as Company merchandise is concerned, and customers visiting our showrooms are directed to patronize their neighbor dealers.

Through newspaper advertising and other forms of sales promotion we are accomplishing a two-fold purpose of educating the public to go to electrical dealers for appliance repairs and, in turn, of making the dealers more receptive to the handling of service work. Repair work can be done at a profit without involving excessive service costs to the customer, and this approach, together with the advantages of customer contact which enables the dealer to build up a profitable prospect record, has been used most effectively in creating the dealers' interest in the servicing and repairing of appliances.

We are considering a program which provides dealers with a plan of selling *preventive maintenance* to their customers on a yearly contract basis. Such a plan would be designed to keep appliances in service and expand their useful life through a series of four inspection and service calls per year. On each quarterly call, the service man would inspect, clean, oil and condition all electrical equipment including lamps and cords in need of minor repairs or adjustments. Major repair work would be done at a price over and above the charge for preventive maintenance. This type of preventive maintenance—call it appliance usage insurance—would be paid for quarterly as the dealer service man makes his scheduled call at the customer's home.

This contractual service program is similar in principle to that recently promoted by several of the leading automotive manufacturers in their efforts to assist their sales and service agencies in weathering the war emergency. The national potential income from this plan for dealers is startling—at only $1.50 per quarterly call per customer contract, the potential market of 30,000,000 homes is $180,000,000 of potential revenue per year. Here is a market of the proportion needed to keep many dealers alive and earning a profit during the war period.

Furthermore, such service contracts would enable the dealers to obtain more repair and reconditioning business without a proportionate increase in tire mileage and general overhead expense—it would enable them to conserve stocks of critical repair parts by preventing, through minor repairs, the complete failure of an appliance—it would facilitate the handling of a greater volume of repair business with a relatively small service organization at a time when skilled repairmen are scarce—it would encourage a substantial volume of secondhand appliance sales provided by unused equipment now on dusty shelves—and it would provide a perpetual prospect list which will serve as a guide in building sales volume quickly when appliances again become available.

Already my Company has been successful in several communities in selling, lock, stock, and barrel, our refrigerator service facilities and repair part stocks to dependable dealers or service agencies who are now carrying on this phase of the operation in a very satisfactory manner. We propose to extend this plan to other appliances.

The possibilities of dealer revenue from service and repair work deserves our consideration, but let us not be naive enough to suppose that the average dealer can survive throughout the duration from this source of revenue alone. Dealers will need to exercise their native American ingenuity to develop and exploit new sources of income in many

instances far removed from their major business.

Recently, *The Reader's Digest* in a series of articles, exposed the racketeering ring which was prevalent in radio and automobile service and repair stations. The customer must be safeguarded against such practices as those which threatened the radio and automobile industries. My Company is meeting that particular problem by maintaining a skeletonized service department whose duties are spread over operating work and similar assignments so that their services may be available for emergency requirements.

The electric industry—manufacturers and utilities—has spent many millions of dollars to create desire for electric service—all designed for electrical living. It has whetted the appetite of Mr. and Mrs. Average American for the goods and services of our industry. It would seem to be highly desirable that we do not let the desire for better light be extinguished, nor the desire for better living languish.

I cannot accept personally the attitude that we have no story to tell merely because we do not have appliances to sell to support our story. We do have a story—a new story—to tell which centers around the use of appliances and service—all of which are tied in closely with the American Way of Living which we are determined through present sacrifices to preserve for our children.

While my Company has discontinued all types of advertising activities and sales promotion plans which would in any way create demand for critical materials, we are continuing to publish our monthly *Electrical Dealers Co-Ordinator* which provides a very effective clearing-house through which important and timely information is disseminated to our entire list of associated dealers. Reports indicate that it is a useful medium in upbuilding and in maintaining dealer morale and giving him ideas of ways to expand his income and reduce his expenses.

Taking a cue from our Agricultural and Industrial Development Department, which has a most successful record in bringing new industries into the territory, in expanding locally-owned plants, in finding new processes for existing manufacturers, and in surveying the territory for new agricultural and industrial opportunities, we are now about to adopt a similar procedure and to apply the same methods for the benefit of the dealers.

We are in the process of organizing a Dealer Research Bureau to be headed by a member of our Sales Promotion Department who is well experienced in merchandising and versed in research work. The primary functions of this Bureau are to be:

1. To survey the merchandise needs and opportunities in each community with a view of determining what additional lines of non-electrical merchandise not using critical materials local electrical dealers could handle profitably.

2. To contact marketing centers with a view of finding new lines of non-electrical merchandise or individual items not requiring critical materials which our dealers can sell.

3. To study the methods used by dealers, electrical or otherwise, in all parts of the country in meeting shortages and these ideas and suggestions will be passed on to our dealers for their use if local conditions permit.

4. To serve as a clearing house for existing merchandise stocks which dealers retiring from business may dispose of to other dealers who welcome the opportunity of securing additional appliances for purposes of replacements whose sale does not require the use of critical materials.

5. To suggest ways and means of reconditioning electrical merchandise for resale purposes and for the extension of ordinary repair service to include refinishing and modernizing of old equipment so as to enable it to remain in service.

6. To keep in contact with those dealers who abandon electrical merchandise departments or close their stores, so that when the war is over and the war jobs to which they have turned are ended, they may be persuaded to re-enter the electrical appliance business.

Our Dealer Research Bureau will be an adjunct to the General Sales Department, which department is already placing special emphasis on the following fundamentals in its program to help the dealers help themselves:

(a) Sell at a profit, avoiding special prices and excessive trade-in allowances.

(b) Sell efficient repair service on a reasonable basis.

(c) Sell contractual service arrangements for preventive maintenance and for expanding the useful life of present equipment.

(d) Keep costs under control by eliminating unnecessary expense to the end that the maximum net profit will be realized from sales and service jobs.

In addition, the Sales Department is presently pursuing a planned program that has for its objectives:

1. *The Registration of Appliances*—aimed at encouraging the dealer to invite the customer to register all major appliances with his establishment giving the name, the make, the model, and date purchased of each appliance. On receipt of this information the dealer agrees, insofar as present-day conditions will permit, to keep on hand repair parts so that the customer's registered appliances may be serviced in a prompt and efficient manner.

2. *The Maintenance of Commercial Contacts*—aimed at keeping alive the interest of the representatives of the food service equipment houses who have been most helpful in the promotion and sale of commercial electric appliances and equipment. This group is supplied with prosective developments in our territory which are favorable to the purchase of such items as cabinets, fixtures, chinaware, cutlery, and the like, in the belief that this type of cooperation will prompt valuable sales aid when electrical equipment is again available.

As the utility industry is searching every means and bending every effort toward *helping the dealers to help themselves,* I am certain, judging from expressions received from manufacturers and distributors, that they, too, realize that this is not a utility problem alone, but one squarely facing every member of the electrical industry—to whom the dealer must look for sympathetic counsel and guidance in solving his problems. With such united effort on the part of the industry, no dealer will conscientiously be able to say that he failed as a result of negligence by members of this great industry of ours.

Mr. Charles F. Kettering, in an article in a recent issue of *Liberty,* sounded the right keynote when he wrote, "The greatest thing we have to learn is to keep looking forward." That truth, so timely spoken, should be constantly kept before us as we corral our best efforts to vanquish the hordes of Hitler, the minions of Mussolini, and the hellhounds of Hirohito. And when the war is won, and with it an everlasting peace—the kind of peace that carries with it the democratic way of life—then, through the American Way of Living, the field again will be crowded with opportunities for individual initiative and creative enterprises such as dealers, distributors, manufacturers, and utilities.

Certainly, if we know WHY we should do *our all* to help the dealers stay in business, we will adopt as our axiom that guiding spirit of olden days so often expressed in Latin—*aut veniam aut faciam—I will either find a way or make one.*

Business Ethics

THE acceptance or practice of business ethics does not require the lowering of a high personal ideal to the average ideal of the group. Conversely, it is not ethically required that a higher personal standard shall be intrusively pressed upon group. Example is better than precept. Furthermore, it is well to remember that the prophet who gave us the most concise of all written rules of conduct, bade us do justly and love mercy. He did not bid us love justice and do mercy. And he bade us walk humbly; which is, alike in business and out of it, the most helpful precept ever given to humanity.—ALEX DOW.

Home Service At Work on the Home Grounds

By Eloise Davison

Director, New York Herald Tribune Home Institute

An address before the General Power Conference, EEI, Chicago, March 24-26, 1942

IT is a real pleasure to be back to a meeting of the electrical industry. As a matter of fact I feel very much at home here at this meeting, perhaps because the question of home service, which you've asked me to discuss with you today, is one close to my heart as it has been for a good many years.

Home Service on the Home Front!

In war times it's not always easy to keep a sense of values because suddenly everything swings around to a new perspective. This happened very suddenly for us on one Sunday early last December. True we'd been "left-handedly" planning what we might do—*just in case of war* — but actually we'd thought "peace" so long here in the United States and believed so hard that "peace" was the right answer, that finding war literally in the front yard proved to be a stunning blow. It meant shifting our whole center of thinking and shifting it fast.

Immediately there were hard decisions to be made! Decisions that continue to grow more difficult every day. Take home service as one example. Actually I'd be willing to wager that no one had looked on Home Service with anything but favor and whole hearted acceptance for many years. As a matter of fact even the violent dissenters of the early days who took Home Service with tongue-in-cheek—and general condescension—had almost unanimously melted down to the place where they no longer viewed it as an expense. They'd grown to consider it a good investment. They'd settled back to that calm, comforting attitude toward home service of being glad "they'd thought it up and put it over." Why? Because through the years Home Service has done for the electrical industry something which had never been done before. *It had tied electrical customers close to the industry.*

But all of a sudden things changed. Less than six months after war swooped down on us Home Service found itself with a spotlight focused on it very calculatingly. True, many utilities have appraised it as something good, well worthy of its hire and are continuing

MISS DAVISON

full steam ahead after thoughtfully gearing activities to the war emergency. This is spectacularly true of the home service departments of some equipment manufacturers as well as of some utility companies. But only of *some*—not of all. Others ran to cover at once and shut up shop with a bang! So the past year has seen many casualties.

We have some direct evidence here today. Personally I can't remember a utility meeting where there were so few of the "fair sex" in attendance. This I hope is due to influenza or grippe (so popular at the moment), or to the fact that home service women are too busy with defense activities to leave their posts! However, sift out all the feminine flotsam and jetsam in the form of magazine and newspaper women in the audience here today and there could be a note of discouragement injected into this very meeting when one tallies up the attendance!

These are days when we must make decisions—decisions which may be far-reaching in effect. We know full well that in a war economy we have to give up many things that seemed essential in an economy of peace. On the other hand we know, too, that there are things we simply cannot afford to be without—the cost may be too great. What seemed a necessity yesterday may easily become a genuine luxury tomorrow. Take rubber tires, sugar, automobiles as easy examples today. Yes! And perhaps coffee and even electricity tomorrow. This is a time for the most careful evaluations, the most calculated decisions.

You've taught these customers of yours to expect service from you over a period of years. You've coddled and cajoled and spoon-fed them until they want the electricity you serve them; they have learned to rely on the service you've offered them through the years.

How easily they'll *un*learn this *alone* —without your help in an emergency, remains to be seen. They've learned to look to you for help on every electrical problem. *From good service to no service may be too big a step for them to take.* The question may resolve itself into, how good will both you and your customers be *in reverse?*

This would seem to be a basis for a deliberate—not a hasty—decision. A decision which must be made thoughtfully, not emotionally, if you would keep the customers' confidence which is so valuable to you. There are perhaps three considerations indicated.

1—You can go ahead with the "business-as-usual" attitude, which of course does not seem to make very good sense.

2—You can eliminate home service entirely, which is easiest but which seems very much like deserting the ship in an emergency.

3—You can curtail service, and adjust it to the war economy, which seems to be a very logical and wise move to make and one which home service women with flexible minds are already making all over the United States.

Change is of course inevitable. We find ourselves snapping out of old routines and into new ones. As we heard this morning, "We are in the Army now." War no longer is on the front line, or in the front yard. It's at the front door in World War II!

We've been lucky in this country thus far, yet one of the biggest problems ahead of you may center largely in the

homes you serve. Household equipment must be kept repaired and in efficient running order. Your home service women are highly trained specialists in both *sales* and *service* in this field. For years their ingenuity has served you well. Their activities might conceivably be greatly expanded as more and more men leave to serve in the armed forces if you keep the equipment on your power lines running and in good repair so that both you and your customers get full value from their investments *for the duration.* It will take years to get another group of people as well trained for this part as are these home service women, who are not only trained but who have the confidence of your customers.

Home service departments, this past year, have established an enviable record throughout the country, of adjusting to the war emergency. They've registered their willingness to use their skills, they've cooperated with the National Nutrition program, the Red Cross. They've taken refresher courses in nutrition, child care, first aid; they've organized and instructed many groups. They've shared their auditoriums, given canning demonstrations, helped budget incomes. They've shifted from individual to group instruction to adjust their mileage to the vanishing tire.

I have been greatly interested in a number of things which Home Service departments have done to adjust to the war emergency. The Home Service Department at Westinghouse is offering a nutrition service to all the families of their factory employees. This is an important service because good nutrition is fundamental to good health. Good health means good production, fewer days off, fewer accidents. This Home Service Department goes along and will keep on going along, because Julia Kiene, the woman in charge, has adjusted her program to the war effort.

Edwina Nolan, at General Electric in Bridgeport, is doing a similar job and is also demonstrating how the recipes developed by her Home Service Department can be adapted to the wartime food rationing program. A sensible, sound program that well justifies the existence of her department.

Fern Snyder is carrying on, keeping her 80 Home Service workers busy on a program adapted to the present emergency needs in the communities her company serves.

Good health, so basic to good morale, is the keynote in all of these and many other Home Service departments at the moment.

The question now would seem to be not can you afford to keep them—but can you afford to let them go? Caring for and repairing equipment must be rigidly guarded if you would keep the public good will. This public with money invested in some 55,000,000 motor appliances, 4,500,000 ranges and water heaters, 30,000,000 radios, 75,000,000 smaller heating appliances such as irons, toasters, waffle bakers, hot plates, roasters, heating pads. Equipment that is useful and should continue to be used, equipment that is today irreplaceable.

You may be of the opinion that the 25,750,000,000 kwhr of electricity used in the home last year, which represents an average of 986 kwhr for each of your 26,750,000 customers, is not important since it represents so small a part of the total electrical utilization story. I don't agree. The big job ahead for this industry may be the novel one of tackling that load seriously to *reduce* it. If it is it will take a deal of intelligent work with the public to do it as painlessly as possible. This is particularly true in the face of our dwindling household servant supply; the greater need for saving; the great urgency for fewer service calls; the greater demands on the housewife's time by war activities outside the home. There's nothing of business-as-usual ahead. Every day means new adjustments. Your customers may not be able to understand this all at once without some help from you. An approach involving both ingenuity and considerable patience is indicated. There may be much to be done on the home front before this war is finished.

An interesting story from the Home Front in England bears this out. It seems that after a very bad blitz, they were digging out the ruins of a building and came upon an old Cockney woman who was very much upset. It took a little while to extricate her, get her back on her feet, and calm her down a bit. Finally when the air raid warden felt she was sufficiently pulled together, he patted her on the back and said, "I guess you are all right now, Mother, but how about your old man? Was he down in there, too?" She pulled herself up indignantly and said, "No, he ain't *there*—he's in the army . . . the coward!"

If ever there was a time when home service might be of value it would seem to be now. The home service staff may be one useful guide to salvaging the consumer business at the war's end for the private utility company. From the meat industry we learn that it took years to get over the meatless days of World War I. Even recently this came to light *for no good reason* as soon as rationing was mentioned. Saving electricity may similarly be hard for consumers to forget.

I have no worry about the home service women. There never has been a time when women were more in demand. Only a few days ago an announcement was made from Washington that over 2,000,000 women will be needed in the war industries within the next year. Excellent courses are being offered right now to train women for special war jobs. In some cases women are being paid a living wage while training for these jobs. There is work for women to do on many fronts. So we need not worry too much about them.

But you cannot replace your experienced home service women easily. Over the past fifteen or twenty years this industry has wisely made a sizable investment in these women and their home service departments—an investment that has yielded profits continuously. Nothing would seem more wasteful than to scrap this investment right now. Keep them working with your customers. Use them as interpreters of this new approach to the war time household electrical problem in order to have a convinced and receptive group of customers to build on when the war is over. When you add this all up—it seems to me the home service department can be made one of your real assets in these war-riddled times!

Canadian Convention, June 10-12

The 51st Annual Convention of the Canadian Electrical Association will be held at Log Chateau, Seigniory Club, Que., June 10-12, instead of June 24-26 at Murray Bay, as had been planned earlier.

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The War and Utility Advertising

By H. S. Metcalfe

Director of Public Relations, West Penn Power Company

An address before the General Power Conference, E.E.I. Chicago, March 24-26, 1942

IN discussing the subject assigned to me, I must rest my case on two assumptions. These are: First, that the war will come to a successful end—sometime, somehow; and second, that after the war we will be operating in a capitalistic economy. Without these assumptions there is hardly any point to discussing utility advertising at all. With these assumptions, however, it is possible to say that the war has affected the problem of utility advertising in exactly the same way that it has affected the entire operating objectives of the utility itself.

A. The Utility's Objectives in Wartime

Like good citizens everywhere, the utility's first, primary, and supermost objective is to help the nation *win the war*. That involves efficient and continuous production of its full capacity of electricity; the protection of its generating and distribution facilities; and the making of all needed extensions of service to the complete limit of its ability.

In this primary objective, the utility is involved not only in the production sphere of war effort, but also in the sphere of civilian morale. Electricity touches the lives and activities of commercial, residential and rural customers almost as vitally as it affects the output of its industrial customers.

These customers, like the utility, have a victory motive controlling them these days; and they, too, are subject to abnormal demands which create an ever-changing, very human scene. Their basic interests are vitally affected; their living habits changed. Thousands of households will be smaller because John has gone to war, and Mary is on some production line. Family objectives, well thought out and planned in calmer days, must be shifted, delayed, or thrown overboard for the duration, at least, and perhaps altogether.

Though all other objectives are minor in relation to the first objective of winning the war, the utility, like other citizens on the home front, has an important secondary objective at the present time. There is a conflict at home in which the life of the American enterprise

MR. METCALFE

system is at stake. The utility industry is a vital part of that system. *Therefore, it must fight to survive, and to come through this crucial period with its assets preserved and fully aware of their post-war value.* Certainly, the direct destruction of war is violent enough! Such assets of our civilization as can avoid direct damage must be zealously preserved. Among them, in the case of the electric utility, in addition to the assets of plant and skilled operating personnel, is one that is vitally important to keep—the character of the industry as a dynamic merchandiser of electrical living.

This audience needs no elaborate review of the story of the electric iron and the toaster, the washer, the refrigerator, the ironer, and the range; the roaster and the water heater; I.E.S. lamps and Better Light-Better Sight. Every item, however, calls to mind the picture of a potent promotional job by the industry; and a corresponding widening of the benefits of electricity to society.

If we are aware of the value of this dynamic merchandising quality in our post-war period, when the vigorous promotion of consumption goods and services will be needed for stability, we will shape our present war-time promotion and advertising policies to the preservation of the market position of electrical manufacturers, distributors and dealers. The benefits of electricity are so excellent a symbol of the standard of living we are fighting for that we must preserve *its* meaning.

Thus we believe that the electric utility views advertising during the war period through the naked realities of its major and minor objectives. First, to help win the war; second, to preserve its assets for post-war use.

Naturally enough, then, the advertising task divides itself into two phases.

1. The New Task: which war has created.

2. The Old Task: which must be reshaped to meet wartime needs.

B. The War Has Created New Tasks for Utility Advertising

New occasions certainly teach new duties. At least three broad new tasks face utility advertising as a result of war, and each task is an open door of opportunity for goodwill building of the highest order.

1. *It must radiate evidence of patriotic support of all victory efforts and interpret the industry's patriotic citizenship in terms of public understanding.* It can tell how the company's services and facilities are being adjusted and used to meet specific war needs. It can help sell Defense Bonds and Stamps, and give a clarion call for aid in all war activities. It is privileged to pay tribute to employees who have gone to serve with the forces or are training for emergency services and for Civilian Defense at home. It can boost the Red Cross, USO, Community Fund and other campaigns. When extra effort and sacrificial service in the line of duty for the Community, Customers or Company are evidenced, it can utter a sincere "thank you"—and a public pat on the back for local industries or companies when they have passed a notable milestone of war effort is well worthwhile.

2. *It must solicit and secure cooperation from the public when emergencies make it necessary.* This is an opportunity

for guiding public opinion and action through the printed or spoken word. When occasions demand restrictions on service, intelligent advertising will prepare the way. New regulations governing installations or services should be made plain. The interference of priorities in meeting customers' requests or furnishing materials desired needs advance and wide publicity. And, as may be necessary, there is a major educational job for advertising if the normal habits and practices of customers in the use of electric service need to be guided into new channels.

To achieve cooperation in times of emergency demands sound direction, plain statement, clear understanding and the example of wise leadership. Advertising must help here.

3. *It must give sound wartime advice to customers and public on those service matters about which the utility, through experience and knowledge, is the wisest guide and authority.* The rushing endeavor to organize groups of all kinds to meet wartime situations frequently tends to create confusion. In this overanxiety to secure action the wisest guides are sometimes overlooked and the benefits of their experience and knowledge lost sight of. Many evidences of this tendency are about us these days. When blackouts are necessary, when emergencies affecting the use of electric service arise, who can guide more wisely than the utility? Again, advertising shares responsibility for accomplishing the task of informing the public.

These are but a few indications of the opportunity open to the advertising of the utility because of the new tasks born out of wartime.

C. The War Influences and Reshapes the Old, or Normal Tasks of Advertising

The impact of war with its quickening of the industrial tempo, the shifting of human relationships, the readjustment of objectives in the drive for victory makes the reshaping of normal utility advertising imperative. Fresh appraisals must continually be made to keep the advertising message in tune with the times.

1. *The vital necessity of electric service in wartime creates a new opportunity for the telling of the institutional story—geared to the moment.* The steps taken to implement war production work can be told with particular effectiveness if it is made clear that much of this reason for the efficiency of the system is due to good management of the past. Far-sighted provisions for future needs made by wise leaders can pay off now if given restrained announcement. Every move to bring V-Day nearer presents an opportunity for reminding that the industry as a whole and its specific units are a worthwhile and integral part of our American enterprise system.

2. *Advertising of an informative service type must continue—with up-to-the-minute effectiveness.* Such electric appliances as are available should need little advertising push. The dwindling stocks of major items will be taken quickly from the floors and shelves.

However, there is greater need, and therefore responsibility, for telling the story of the plus-values of the "electric way of living" repeatedly. What an opportunity this day presents for honest, convincing copy which tells the wartime benefits of electric service in the home, store, on the farm and in the factory!

When economy, conservation, and saving are key-words in terms of time, money and energy, there is where the contribution is greatest. The story of electric cooking and refrigeration with their help in cutting the kitchen budget, combating "hidden hunger," providing vegetables, meats and cereals for modest menus, teaching how to appetize, economize and energize points the way to dramatic copy. Light—for eye-conservation, for safety, for greater production in days of mighty demands; light for morale, for cheer, for hope; fluorescent light with its magic appeal and its many applications—these stories with wartime emphasis need continuous reiteration.

Again utility advertising must be of help to the electrical dealer. He, too, is bedeviled with new problems, in the solution of which he looks to the utility for advice. In supporting his activities, calling public attention to services he can render which are mutually helpful, we help our customers and maintain dealer goodwill.

Making the most of what we have is today's by-word. The proper care, operation and maintenance of existing electrical equipment involves the education of our customers. Advertising will stress service and repairs to keep this equipment usable.

The continuous emphasis upon the basic services rendered by electricity, adjusted to wartime situations, in all the manifold applications cannot help but lay a solid groundwork for post-war sales endeavors. Human wants, unsatisfied as they must be for the present, must be nurtured against the day when they can be supplied.

Through all this advertising, two vital threads should run. One is the thread of morale-building—the fibre of strengthening. We are given the privilege of voicing a continuously assuring word. We are a producing, creating, conserving, saving, strong nation and the industry's leadership, personnel, service and facilities are all dedicated to the major objective of winning the war.

The other thread is the constant reminder that free enterprise as well as free peoples is worth fighting for. We cannot win wars by going out of business. There is nothing unpatriotic in self-preservation. We can show our patriotism by support in the primary war efforts and, at the same time, fight for free enterprise. Our advertising in wartime will maintain this theme-song in a major chord.

D. Fundamental Policy Does Not Change

Though the war may create new tasks and reshape old ones in the utility advertising field, the fundamental philosophy which guides the advertising man in his work does not change. There is still the task of conveying a message via media to a market. This message must be couched in language and picture so that it will be arresting, convincing and resultful. The media which conveys the message will be determined by its ability to carry the story economically and effectively to the market. The market in all its changing phases will be carefully analyzed so that the end result of advertising will be productive.

The utility advertising manager recognizes that an important responsibility is his, and particularly so today. He realizes, however, that though his task is vitally essential, it is but one part of a cooperative whole. With others, he must voice the company's story in all its ramifications for the public, today's story of a major objective—an essential service now dedicated to the primary task of winning the war; and the important story of the minor objective, that the industry which has done so much and is now so symbolic of our free American enterprise should be kept alive, so that it can serve efficiently to meet post-war needs and help to build a stronger and better tomorrow.

I am convinced that there should be an ethical overtone in this institutional, educational and commercial task. We are under moral compulsion to proclaim

(*Continued on page* 135)

Assisting the Customer to Make Maximum Effective Use of His Existing Electrical Facilities

By E. A. Brand

Buffalo Niagara and Eastern Power Corporation, Buffalo, N. Y.

An address before the General Power Conference, E.E.I., Chicago, March 24-26, 1942

SEVERAL months ago, Mr. O. E. Hunt, Engineer of General Motors, while discussing "Model Changes—War Style" at a meeting of the Automotive Council for War Production in Detroit, outlined the essential steps required to change from automotive to war production. Mr. Hunt stated:

"Flexibility of Mind—Flexibility of Equipment—Flexibility of Tools—all are vital to the accomplishment of these ends."

Further on in his discussion, he made this point:

"In war, having the needed material in time is the all-important consideration. Nothing is more costly than a war lost through lack of needed defense weapons. For that reason and because of the critical shortage of machines, we must revise our normal policy and use any machine and every machine available, that is reasonably adaptable to the job at hand."

These two statements can well be considered the keynote which the power customer contact groups of utility companies must continually keep in mind during the present emergency.

It is not necessary to dwell on critical material lists, on priorities, allocations, and limitations. These are a familiar story to all. The question is how to circumvent their effects on customers who are attempting to convert from peace-time to war-time products, or to meet doubled and trebled production schedules in a plant already humming.

Equipment and supplies which, even recently, would have been ordered with little question of delivery now require priorities of a rating which many plants cannot obtain. Even when they can be obtained time is so much of the essence in many cases that the slow deliveries dictate other action. Flexibility of mind and of materials is essential.

The utility men and departments serving industrial customers today must themselves adopt the flexibility of mind mentioned, if they are to be really helpful to the industrial swamped with war orders or attempting to get his feet wet in sub-contracting.

In this discussion we naturally are

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interested in electrical items, and find that almost the entire line is involved in shortages and substitutions. There are bottlenecks in wire, in switches and conduit, in motors, transformers, melting and heat treating furnaces, ovens, lighting equipment, and even Diesel engines and boilers.

The problem becomes one of ingenuity. It requires a flexibility in approach and an adaptability to rapidly-changing conditions to a degree which utility contact people have not had to face before, not even during the first war. It is necessary to find solutions, other than the obvious ones, to customers' problems. We must look for answers that require the least amount of new critical materials, that reduce the time needed to get operations under way, that keep existing equipment on the line, and that avoid unnecessary load increases.

Every one knows and has used power factor studies, load characteristic studies, equipment use studies in order to sell load; these are old standbys in the power salesman's kit. Now they are in the front line trenches, more often than not, to avoid load increases. In addition, we must know our way around in materials substitution and must have a close knowledge of "what is available where."

Here is an example of how knowledge of the customer's load and a power factor study were of value. A firm manufacturing various equipment for the navy, with a demand of 900 kw was supplied from a company feeder of 1250 kva capacity. Due to the customer's 63 percent power factor, the feeder load was approximately 1400 kva. The customer wished to add 300 kw, and asked for an additional circuit. The cost of a new underground cable from the substation, for new receiving breaker and line panel, would have been approximately $16,000. It was admitted that after the war there would be no need for the increased capacity. Our company representative suggested that capacitors be installed instead, to improve the power factor so that the existing feeder could handle the addition. As a result, the customer has initially ordered 400 kva of capacitors at a cost of about $6,000 and is planning to install more. He is improving the voltage regulation, is saving $100 monthly due to reduced power factor charges, and still has only one feeder. A very tidy saving in critical materials and in money.

Sometimes load studies reveal peaks in the customer's load curve which can be shifted to valleys and thereby release valuable capacity. A metalware manufacturer wished to add 100 kw to his present load. The transformers, with excellent power factor, were very nearly loaded and it seemed as though additional capacity would be required. A study of the load curve showed a decided daytime peak. A piece by piece study of the plant equipment revealed that a seam welder taking 82 kw at 92 percent power factor, which was operated during the day-shift only, could be transferred to the second shift. This was done by the customer and the 100 kw of new load was taken care of by the existing transformer capacity. Incidentally it created practically no additional peak demand on the utility.

As another flexible approach, we have

found it valuable to keep in touch with the used equipment market, not only with regular dealers and distributors of used or rebuilt machinery but also with manufacturers' representatives who frequently take perfectly good equipment in trade. With the increasing difficulty of obtaining new compressors, motors and other items, the knowledge of "what is available where" has made it possible for us to help customers out of difficult situations in a number of cases.

As an example, a glass manufacturer, whose firm had just recently taken over a competing plant, wished to step up production at the new location and found a decided shortage of compressed air. About 600 hp of synchronous motor driven air compressors were in use in the parent plant. There was also an almost new high pressure steam boiler. Ostensibly this was installed to provide steam for preheating and injecting about 10,000 gallons of Bunker C oil into the melting furnaces per day, actually it had about 150 hp excess capacity. The customer was unable to purchase a new electrically operated compressor for the new plant. He did find a used steam compressor which could be installed at the parent plant, served by our company, thereby releasing one of his good electric compressors for transfer to the new plant located outside of our territory. We did not like that and secured a promise that if we could find him an electric job with the proper characteristics he would buy it. We did—and he did—purchasing it from a used equipment dealer in Chicago by telegraph, after two phone conversations, without even inspecting the unit before purchase.

In another case, an industrial who had been using two Diesel engine driven air compressors suddenly found himself limited in capacity when one engine failed completely. He planned to bring in two portable Diesel sets from an affiliated plant and install them permanently. Our contract man, however, due to his knowledge of customers' equipment, put him in touch with a boiler manufacturer who had shifted almost completely from riveting to welding of pressure vessels and hence had excess compressor capacity. As a result, one of the spare units was sold to the first company and we secured the additional load.

This may seem like acting as middle man in the second-hand business, but at the present time close attention to this phase of the activity is greatly appreciated by customers who find it impossible to purchase new equipment. At the same time, it is the means of holding and increasing existing loads.

A rather unusual activity revolves around the type of transformers purchased by customers served at 22,000 volts. Our standard 60 cycle station transformer is a 3-phase, 2500 kva, 22,000-4160 volt unit. Where customers are establishing 22 kv substations, they are urged to purchase units of this type. As an example, one customer doing heavy navy work and establishing a new 22,000 volt service planned on three 667 kva single phase transformers. It was pointed out to him that the company's standard unit included built-in transformers for relaying with the system, cost less money, and could be obtained from a number of manufacturers with 3 to 4 weeks shorter delivery, since it was a completely standard item. As approximately 100 are in use on the system a number of spares are always available. This knowledge gives the customer an added feeling of security in case trouble develops with his own unit.

Now let's talk about another phase of this problem. Wiring materials and supplies have been getting very tight.

Here is a simple example to show what can be done by substituting materials. An airplane manufacturing plant, in the days before priorities, had constructed a pole line on its property carrying two 22,000 volt feeders. Recently this customer found it necessary to extend a number of 4160 volt circuits in conduit in one of the buildings. Delivery on 5000 volt single conductor wire for the purpose was quoted at 15 weeks. When we were approached for the loan or sale of some 6000 feet of such wire to help out in the meantime, our salesman pointed out that the conductors on the pole line were insulated for 5000 volts and that 5000 volt insulation on open conductors on pole tops was really a luxury. As a result, the customer purchased 6000 feet of weatherproof wire from a local wholesaler's stock, hung it on the poles, and put the 5000 volt conductors into his new conduits indoors.

Here is another case to show how a flexible attitude towards normal rules and regulations can assist the customer. Not long ago an industrial served from the low voltage network through a 1000 ampere breaker required double plant capacity due to war work. A new 2000 or 3000 ampere breaker carried a long delivery. On the other hand, a new 1000 ampere breaker was available locally without delay. Instead of requiring one new large capacity unit as service equipment, it was felt satisfactory to install the second breaker alongside of the first one and thus have two breakers to control the plant load. This is thoroughly in accordance with the National Electrical Code but is a practice that, in the past, has largely been applied to residential and commercial work. We should be flexible enough to use it and others permitted by the Code.

At the request of WPB, the NFPA Electrical Committee recently took action to re-adopt the higher current carrying values of the 1937 National Electrical Code for type R (Code grade) building wire as an emergency measure. Other Code changes to conserve vital materials are in the offing, such as approval of covered neutral cable in defense housing and emergency government construction, and the use of weatherproof insulation instead of rubber coverings for neutral conductors in interior wiring. To save as much critical material as possible we can go a step further and use the completely uninsulated neutral. This can be done under trial installation procedure.

In the past metal-clad systems have been the accepted standard for industrial plant wiring. To avoid long deliveries in conduit, busways, etc., and to save critical materials, open wiring on insulators should be more generally used. Insulation by separation still is one of the best and safest methods of wiring known. Open work can be installed with practically no use of rubber if weatherproof or slow-burning weatherproof wire is used, and practically no use of steel except for nails, screws or bolts. Porcelain insulators are still readily accessible. Since much of the additional wiring now necessary in defense plants is intended for the duration of the emergency only, the use of open work and WP conductors has much to commend it.

This basic problem of wiring and its effect on plant production is well expressed in a letter recently received from the Chief Commercial Executive of a large utility:

"In this connection, a large number of our customers have experienced operating difficulties such as low voltage, overloaded circuits and switches, and have called upon us for assistance. The trouble is caused primarily by the large number of machines that are being connected and the increased burden on existing equipment. In many cases the plant expansion is so rapid that the operating personnel does not have time for proper planning. In other cases the operating or maintenance personnel does not have the technical assistance or testing equipment necessary to adequately provide for the additional load."

These thoughts outline a number of ways in which utility company personnel can be of real assistance to industrials. It must be remembered that most plants normally operate a single shift and have built up their maintenance and technical crews on this basis. They are now operating two to four shifts and many do not have trained electrical crews as yet for night time operation, hence small troubles during these periods are magnified due to lack of expert care.

The power analyzers, the tong-ammeters, the other instruments to which most company departments and good electrical contractors have access should find increasing use in running down the troubles so well outlined in the quotation. The cause, in many cases, will be poor power factor. While the obvious answer would seem to be capacitors, the misapplication of induction motors should first be checked. One type of technical assistance formerly generally available to industrials has largely been withdrawn, namely the advice of manufacturers' technical representatives and those of the larger distributors. Under the circumstances, and because motors of the various types desired are themselves scarce, misapplication of motors and of control equipment is probably more prevalent in the mushrooming of industrials today than in the normal leisurely growth of other years. The utility man again can be of tremendous assistance in this connection.

We have a new customer service function to perform for our customers. Utility systems, in general, are now carrying capacity loads. As a result system troubles, which during earlier days would easily have been shaken off, occasionally develop into troublesome interruptions. With plants operating around-the-clock it is desirable that the power customer contact group be kept informed of outages to important customers, so that they may pass along the story of the cause and the probable length of outage, and the customer in turn can adjust his operations.

In our company the dispatcher, during the day, notifies our bureau of interruptions of consequence to a primary customer; this may be by customer name, or by feeder and substation number. Our records indicate the customers served by each feeder and substation.

Three men in the department have this necessary information at their homes and are subject to call by the dispatcher during other than business hours. It is not pleasant to be routed out of bed at 3 a.m. to be told of an outage at the XYZ company, but it is gratifying to know that the XYZ manager appreciates the information relayed to him that service will be restored within 2 hours, as he then is in position to adjust his operations and to dispose of the 300 men that are standing idle.

This discussion would not be complete without reference to the WPB field offices, their work, and the cooperation that can be established with them. In Buffalo we have an excellent one which has done an outstanding job in carrying the story of conversion to war work to the small industrial customer. The large majority of them are now doing war work of one type or another, and we have lost practically none as yet.

Many of these firms are awed by the routine and by the complexity of forms used by WPB. They become discouraged at their inability to secure war orders on first attempts. Our men are familiar with the routine, with the more important forms and carry one or more, such as the recently issued PD-25-X. Calling this form to the attention of small customers—it was developed for firms doing less than $100,000 worth of business per year—has made it possible to bring additional ones into the WPB fold and get them started on war work.

Now, as never before, maintenance of existing equipment is a real problem. Many Electrical Leagues are sponsoring programs for the maintenance engineers of industrial plants. These should be intensified wherever possible to cover various phases of operation, maintenance and conservation of electrical equipment. As an example, the Air Conditioning Council of Western New York, in converting itself from a sales promotion to a service organization, recently sponsored an evening devoted to the operation and maintenance of control instruments employed with air conditioning and ventilating apparatus. Despite pessimistic viewpoints that attendance would be small, because everyone was so busy, about 300 industrial plant men attended this highly specialized meeting. Good maintenance programs will draw good attendance because they are particularly timely.

In this talk there has been no attempt to outline completely the present day functions of a utility group contacting industrial customers. Instead, some examples have been cited to show the type of problem and the various approaches to reaching a solution. Other items have been philosophized about. Western New York is a highly industrialized region, so much so that more than 80 percent of the kilowatthours sold by our company go directly to industrials. The majority of these are now doing war work, many with A-1-a priorities. While this high percentage of industrial sales may be an exception, many of the situations we encounter are common to other companies as well, and this material has been presented with the hope that some of the ideas discussed may be found useful generally.

Missouri Association Elects Officers

D. W. SNYDER, JR., president of the Missouri Power & Light Company, Jefferson City, Mo., was elected president of the Missouri Association of Public Utilities at the Annual Business Meeting of the Association in St. Louis, April 14 and 15. Mr. Snyder succeeds Ben C. Adams, of Kansas City, Mo., who has been president two years.

The other officers elected were: First vice-president, C. A. Semrad, St. Joseph, Mo.; second vice-president, J. F. Porter, Jr., Kansas City, Mo.; third vice-president, J. W. McAfee, St. Louis, Mo.

New members of the Executive Committee elected were: B. C. Adams, Kansas City, Mo.; Alfred Hirsh, St. Louis, Mo.; L. W. Helmreich, Jefferson City, Mo.; L. W. Laughlin, Springfield, Mo.

Speakers at the meeting included Hugh H. Clegg, assistant director, Federal Bureau of Investigation, Washington, D. C., and H. S. Bennion, vice-president and managing director of the EEI.

A Defense and Safety Meeting, and annual dinner, was held on Tuesday evening, April 14. Hugh Stephens, vice-chairman of the Missouri State Defense Council, delivered an address on "Utilities and National Defense"; Oliver T. Remmers, lawyer, and past president of the St. Louis Safety Council, spoke on "A Quarter Century of Safety."

Frank M. Roessing, Director of Public Works, Pittsburgh, Pa., addressed the meeting on "Utility Conditions in England as Viewed by an Official Observer." Thomas N. Dysart, president of the St. Louis Chamber of Commerce, spoke on "The Home Front" at the luncheon at noon Wednesday closing the convention. A safety playlet, "Safety Sam and Haphazard Harry," was presented by Owen A. Best and Harold Hamby, of the Arkansas-Missouri Power Corporation.

Opportunities for Conservation of Critical Materials in Victory Housing and Industry

By J. F. Porter, Jr.
Vice President, Kansas City Power & Light Company

An address before the General Power Conference, E.E.I. Chicago, March 24-26, 1942

AT Willow Run, Henry Ford has built the largest room in the history of man. It is over half a mile long, nearly a quarter of a mile wide. Through the dust of construction, no man can see from one end to the other. According to *Time* magazine, Willow Run's job is to turn out a four-motored Consolidated bomber every hour. Ford will turn them out ahead of schedule if we help him get the materials.

We of the Electric Companies deal in the materials of Victory in the field of wiring, and our job is to save every ounce and scrap we can. Fortunately we have made a start in our thinking, because our efforts during peace time have been to secure for our customers, through saving material, more capacity for the same cost. In peace time we designed jobs with plenty of surplus capacity for future growth. Our work was a peace time effort in a reasonably profitable era. We were satisfied and proud of an occasional job here and there which gave more capacity to the customer and more work to labor, without increase in cost.

Now we are at war. It is imperative to save every ounce of copper, rubber, zinc, steel. We must eliminate surplus capacity for possible future growth, providing only for immediate war needs—and we must make sure that every job goes in using the minimum of Victory material.

How are we going to save the maximum of Victory materials in every residential, commercial and industrial wiring job?

You all know the old story of the book agent trying to sell a book entitled "How to Farm Better" and the farmer saying to him, "Shucks, Son, I ain't farmin' half as good as I know how, now." Since none of us has been conserving materials half as well as he knows how, the purpose of this talk will be, not to bring out anything new, but merely to remind us all of the things we know how to do that we should be doing.

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First, we know that uncorrected fluorescent lamps, induction motors, domestic refrigerators and mercury vapor lamps are all inherently low power factor devices—in many cases as low as 50 percent. By correcting power factor in these devices, we can double useful capacities from the prime mover to the end of the branch circuit to which the corrected device is connected. For example, the Kansas City Code allows 24-40 W. uncorrected fluorescent lamps per circuit, and 48-40 W. corrected lamps per circuit. For essential lighting, the saving in copper and rubber is of course approximately 50 percent.

Second, we know that the development of new materials and wiring devices will save. For defense housing, CNX, Knob and Tube and Romex have been put on the government critical list in that order. On March 12, 1942, the National Electrical Code Committees for Articles No. 300 and No. 310 recommended the adoption of CNX for residential and war emergency construction. At the same time, they recommend the use of weather-proof and slow-burning weatherproof wire for grounded neutral on all types of circuit allowed by the code, not exceeding 208 volts to ground. This, of course, would make the knob and tube saving approximately the same as CNX.

At this point you are saying, and rightly, that while we have not reached perfection, we are already doing more than ever before on improving power factor and getting new wiring materials into use. But strangely, we have done very little about the third and last suggestion, which is this:

We know that a better, more intelligent engineered use of present wiring materials, especially in commercial and industrial work, will save quantities of copper, rubber, zinc and steel. For example, we have in Kansas City an office building finished in 1931. This building is supplied with a 3-phase, 4-wire, 115/199 volt distribution system. Each 2-wire branch circuit has its own feed wire and its own neutral. By re-connecting the branch circuits 3-phase, 4-wire, using a single neutral for three branch circuits, this building can increase its capacity 50 percent without the use of an ounce of additional copper. In new construction, this method of connecting branch circuits can, of course, save approximately 33 1/3 percent of copper.

At this point you are saying—that's all fine, but the electric company cannot control wiring procedures to save materials. That's right. It will take all elements of the electrical industry in our individual towns working together to apply to wiring what we already know, so the maximum amount of Victory material can be saved.

To illustrate one way of working together, let me tell you of Kansas City's experience.

For wiring purposes, our town falls into three groups:

First: The residential construction industry;

Second: Architects and consulting engineers; and

Third: The so called "electrical industry" which includes: electrical jobbers, manufacturers' agents, organized labor, electrical contractors, city electrical inspectors and electric company employees.

For the residential construction industry, we have established an electrical planning service similar to that rendered in many other cities. Over a year ago, the Federal Housing Authority approved CNX cable in houses insured by them, provided the electric company would agree to plan and check each job at least until FHA inspectors were thoroughly familiar with the best ways to use this material. Nearly 200 houses outside the city limits have been wired with CNX as a result, and it has become in the Kansas City area a familiar material.

This electrical planning service to the residential construction industry, having accomplished its original peace-time purpose, now easily assumes its two-fold part in saving Victory materials.

First it will provide the builder with wiring layouts so locating the limited number of outlets permitted, as to give the occupant of the home the maximum immediate service and convenience.

Also, it will so engineer the wiring system serving these outlets, as to conserve the maximum amount of copper. Savings of 30 to 40 percent in the amount of copper used are possible in planned wiring systems, as against the shotgun installations which have been the practice in low-cost homes.

For the architects and engineers, the electric company has maintained for nine years a Lighting Institute which serves as a bureau of information on lighting, wiring and all commercial utilization problems. Architects and consulting engineers are encouraged to come to the Kansas City Lighting Institute to gather information and material in the Library —to conduct experiments incident to their projects, and generally to secure information on all things electrical in just the way they want it. Proof of the value of this service can only be obtained from Kansas City's architects and engineers and their clients.

For the "electrical industry" generally, we have had in Kansas City for the past three years, a local industry educational program. These weekly meetings, held in the Lighting Institute in the Electric Company building, are attended by electrical jobbers, manufacturers' representatives, members of organized labor, members of the National Electrical Contractors' Association and other electrical contractors, the City Electrical Inspectors, and electric company employees. This group, organized as The Adequate Wiring Club, had for its first president, the president of the Greater Kansas City Chapter of National Electrical Contractors' Association. The second year, the president was the City Electrician of Kansas City, Missouri. The president the third, and present year, is Marshall Havenhil of the Commercial Sales Division of the Kansas City Power & Light Company.

The Club has studied various problems of mutual interest, which are common to your community and ours. One of the group, the present President of the local I.E.S. and the past President of the Greater Kansas City Chapter of the National Electrical Contractors' Association, Mr. A. E. Smiley, makes this significant statement—"These meetings are the greatest thing that ever happened to the electrical industry. They have shown us that our real trouble in the past has been that we just haven't known what we have been talking about." Mr. Smiley has delivered a lecture on the subject of this co-operative movement at the Nebraska - Iowa Chapter Meeting of the I.E.S. and later at the North Central Electrical Association Meeting in Minneapolis.

Another member of the group, Mr. John Wetzig, the business agent of our local electrical union, I.B.E.W. No. 124, has stated that he hopes he will be able to bring substantially the information discussed in these meetings to all members of his local at the earliest possible moment.

The Adequate Wiring Club list their specific accomplishments as follows:

1. A maximum of co-operation between the Jobber, Contractor (and his workmen) City Inspectors and the Electric Company.
2. Promotion of constructive legislation in the local electrical code.
3. Promotion of installation practice with the greatest possible savings.
4. Development of procedure of installation and uses that have given the public a higher standard of work—at material savings and almost trouble proof operation—especially in fluorescent jobs.

By power factor correction, use of new wiring materials, and improvement of engineering and design in commercial and industrial wiring, great savings in Victory materials can be secured.

These savings will be secured only by the whole electrical industry in every community in the United States understanding what is best to be done and then doing it.

Those bombers at Willow Run, and all of the other fighting tools they typify, will come off the assembly line ahead of schedule if everyone using Vctory material does his part, in saving it. Our part as electric companies is to supply the local electrical industry in our own communities the help in working together which they have the right to expect from us. There is no glamour in this job—it demands long hard steady work. It is our obligation—our opportunity—our privilege.

The War and Utility Advertising

(*Continued from page* 130)

the necessity of saving time, money and energy today in order that we may be able to spend ourselves for the immediate task and for the long-range future. It is essential that we learn the virtue of giving to the uttermost in service for the nation in order to get that victory which alone assures our freedom. Corporate and personal sacrifices are dictated for the duration so that we may better serve in the years to come, and we may be well sure that old ideas will have to die if life is to be abundant tomorrow.

Can we formulate a test of a utility's wartime advertising which may prove valid? I think we can—a visual test. If, when the war is over, your customer and mine should have laid out before him all the advertising of our companies during the war years, what will his reaction be when he looks it over? Will he find in it narrow thinking, small objectives, selfish concern, smug complacency and say, "That company was so short-sighted that it missed its supreme opportunity when the door opened"? Or will he find in his survey of our wartime announcements a frank appraisal of opportunities offered and cooperation given to met the nation's needs—its industrial needs, its social needs, its financial needs, and its human needs, so that he may rightly voice the sentiment, "I want to do more business with that outfit from now on because, in the days of distress, it exemplified the spirit of a free, democratic and cooperative America"?

Converting Civilian Production to War Production

By W. H. Wheeler, Jr.
Chief, Contract Distribution Branch, WPB, Washington, D. C.

An address before the General Power Conference, E.E.I., Chicago, March 24-26, 1942

YOUR Industry's great power development is now being harnessed to our war effort. Yours is not a conversion job. In that you are fortunate. Your product, unchanged, fills a basic need for war as well as for civilian life. Now, in this crisis, you are called upon to supply more than ever before in new places and in vast quantities. Your product can't be neatly boxed and shipped as it comes off the production line. It requires networks of plants and distribution systems to bring it to the points of need. You are filling that need. But that, by no means, is the limit of your contribution.

Your executives have an over-all knowledge of industry that is unique; your representatives know and are known to the operators of practically every plant, factory and shop in the nation. In many cases they have not only knowledge of the machines and other manufacturing facilities of industries in their areas, but also a pretty keen appreciation of the abilities of the men who manage and operate them.

No group is better qualified to assist in that part of the work of the War Production Board with which I am associated — the Contract Distribution Branch of the Production Division. It is the special assignment of this Branch, in cooperation with other units of the Board, to broaden the production base; to speed production by the utilization of all practical manufacturing facilities —particularly those of moderate and small-sized plants.

We are carrying out this assignment in a highly decentralized operation through the 120 field offices of the War Production Board. As an essential working tool, each of these offices must have an inventory of the production machines and other manufacturing facilities of the plants in its area. For this purpose, a national survey of all manufacturing establishments has been in process for many months and is now nearing completion. Members of the Edison Electric Institute have been of great assistance in this connection. Not only have all

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available data been supplied, but in many instances engineers have been loaned for survey work, or have secured the necessary information in the course of their regular work.

I want to take this occasion to express our keen appreciation and thanks to the members of the Institute who have contributed, and to the officials of the Institute who have been exceedingly helpful in making arrangements for local cooperation.

At the same time, I want to inject a note of caution about survey work. During the past year, industry has been subjected to an epidemic of surveys for one purpose or another. Some of them have been made by governmental agencies and some by private agencies desiring to help. Everyone has been asking for information which it appeared should be useful. Much duplication has occurred and Industry has been overburdened with questionnaires, to the point of interference with production.

For these reasons, I ask you gentlemen—in your contacts throughout the nation—to discourage further private or local governmental efforts along these lines. We in Washington are doing everything possible to reduce and coordinate the need of the various national agencies for information.

Prior to Pearl Harbor, Contract Distribution was a division of the former OPM. It had been created by the President for the specific purpose of spreading defense contracts among smaller concerns to lessen the dislocations and casualties which were resulting from priority pressures. Defense production for the sake of efficiency had been more or less concentrated among the larger concerns. To a considerable extent, therefore, Contract Distribution was a relief job and, in many respects, in conflict with the interests of the armed services in securing the most efficient production.

Pearl Harbor changed all that. The significance of the change is represented by the fact that Contract Distribution has become a Branch of the Production Division. With the new enormous war production program, all practical manufacturing facilities are now badly needed. Under pre-war conditions, the facilities of many moderate and small-size plants were "sub-marginal" for munitions production. By and large, their equipment is not as modern, as fast and as automatic as equipment in the larger plants. Moreover, the majority of small plants can be used only through subcontracting or pooling operations, both of which substantially increase costs.

But speed—not cost, is now the determining factor. The degree of "efficiency" is not important so long as a definite plus-contribution can be made to war production. Within the limitations of man-power and material, and always remembering that the guns must fire, the planes must fly, the ships must float, and the tanks must run, all possible manufacturing facilities must be brought into war production.

Under the changed conditions, then, small business as a whole should fare much better, but not all small business can participate in war production. The costs and casualties of war fall unevenly on us all. No one will deny that small business has been the hardest hit so far. But many large businesses have been hit

hard as well. Large or small, every manufacturing plant has got to continue to exert itself to the utmost, to find its proper place in the war economy. Government can and does help, but there is no substitute for individual courage, initiative and ingenuity in meeting any crisis. That's what we expect of our soldiers and that's what we must expect on the industrial front.

Prior to Pearl Harbor there were some eight billions of dollars authorized in plant expansions for munitions production. The results of this are now beginning to be felt.

Since Pearl Harbor, authorizations for expansions have continued at even a more rapid rate. No one can say how long this war will last. We must do our utmost to keep on accelerating our output of munitions.

But while recent expansions are insurance against future needs; while we can ill-afford not to plan for them, of greater importance is our production now, in the remaining months of 1942, with the tools that we have.

This can be done in two ways—bringing the tools to the work, or the work to the tools. Where the tools can be brought to the work by sale to the prime contractor, this is usually the method to follow, provided he has the floor space for them, and provided the subtraction from a complement of machine tools existing as a nucleus elsewhere does not destroy the utility of that nucleus.

Most of the field offices of the War Production Board conduct exchanges for the registration of machine tools offered for sale or required for purchase. In addition, a nation-wide campaign has just been launched by the Machine Tools Branch of the War Production Board to unearth idle tools of certain types which are especially critical. Your field representatives can do much to cooperate in this campaign by obtaining lists of such critical types of tools from War Production field offices, and by reporting to these offices the location of any such tools as may be known to be idle, or to have unused capacity.

But as I have said, in transferring tools we must be careful not to break up a usable complement of tools which, as a unit, can be better brought into production through pooling or subcontracting operations. The Contract Distribution Branch is primarily interested in this phase of production. Through its field personnel traveling throughout each area, through permanent exhibits of components and parts offered for subcontracting; through traveling caravan exhibits of similar items; and through its established offices, it endeavors to bring facilities and requirements together. It has evolved means for broadly disseminating simple basic information as to job requirements—in lieu of costly and burdensome blueprints and specifications—in order to bring potential subcontractors into contact with prime contractors.

Your representatives should urge all prime contractors with work to subcontract and plants with unused capacity, to contact the nearest War Production Board field office. Your representatives, themselves, should become familiar with the type of work prime contractors in their area are undertaking, and encourage them to utilize all the available facilities of the smaller plants around them to speed their output.

Bear in mind, again, that speed in the production of munitions which meet specifications, is the one and only consideration. This does not mean a rate of production a number of months hence, or the output per man or per machine now. It means the greatest total number which can be produced during the remainder of 1942, utilizing any and every means possible.

Cost under the present emergency conditions is no longer the gauge of efficiency. It is definitely inefficient and obstructive to limit or restrict production because of that factor. Most new contracts now are being negotiated so that all fair and reasonable allowances for increased costs which contribute to speed, may be made. Existing contracts taken on a fixed price basis may be, and should be, reopened where more speed in production can be obtained, if provision is made for a fair and reasonable increase in costs therefor.

Our present situation requires a new boldness and imagination in approaching all manufacturing and engineering problems. Heretofore we have measured them in an entirely different way than we must do now. Change from orthodox methods necessary to meet an emergency, generally comes to human beings through shock. The danger must become real and apparent. In England, for example, up until Dunkirk, it was necessary to make subcontracting mandatory in order to speed production; but after Dunkirk this was no longer necessary. Industry really went on an all-out basis to get their bits and pieces made wherever they possibly could.

With Hitler's armies standing across a ribbon of water so narrow a woman once swam it, England plunged overnight into the desperate business of putting together at once some sort of weapons to replace those lost in France. Finding war-time uses for peacetime machines became a race against time.

Factories, large and small, found work they could handle as prime contractors, subcontractors and sub-subcontractors. War production jumped from 20 to 60 per cent of the national income, as each factory and shop went all-out. Plants and workers who, for decades, had turned out such things as fountain pens, safety pins, and lipstick holders, began to make parts of implements with which to fight.

The example of our Allies, besieged and weaponless, making themselves a war machine under the most terrific pounding by bombs in the history of uncivilized warfare, is indeed a stirring one.

It is our job—yours and mine—the job of every thinking-citizen in the country, to help to similarly arouse this country now. By comparison, we are fortunate. For although U-boats ply along our shores, and our coastal cities undergo practice blackouts, our two oceans are wider than the channel and our outposts keep the enemy thousands of miles away. This gives us our chance—if we will but take it, without bombardment or immediate threat of invasion—to stir ourselves to a really all-out effort.

For despite our protection, this country is in grave danger. The grim communiques make it painfully clear that far from winning, we are at present actually forestalling defeat by fighting a delaying action—heroic but humiliating—with American outposts sparring and dying to give us the time we need; to muster more tanks and planes and ships with which to fight.

We know now that our one-ocean Navy, and our defense-emergency Army, and our guns and butter economy, could not successfully wage a two-ocean, four-continent war. We know that we are in a life-and-death struggle, and that to win, indeed to keep from losing, we must exert ourselves to the very limit of our capacity.

To do less, is to risk disaster. To delay is to betray those valiant soldiers, sailors and marines that hold back our foes to give us this chance to arm.

American ships are being torpedoed within shouting distance of our shores. Bataan's gallant men, lacking tanks and

planes and reinforcements, were forced to adopt the tactics of the Indian to stand off 200,000 mechanized Japs.

Each day's delay means more ships sunk, each hour spells death for more American boys.

We cannot spar like this forever. We are in a fight for keeps, and we are fighting without gloves and with no holds barred. We must arm with everything we've got. Anything short of that cannot be tolerated while thousands of our young men; your brothers, sons and neighbors are perishing.

Much has been started for our total effort. Before Dunkirk the United States was spending at the rate of two billions a year for arms. Now we are out to spend twice that much every month. We are out to do in two weeks what it took us a year to do before Dunkirk. We are out to do in a day what we did in fifty; in an hour, what took more than two days.

From June, 1940, until the Japanese attack at Pearl Harbor, the total funds

(*Continued on page* 148)

Household Appliances Determine Amount of Electricity Used

THE adjoining table, graphically illustrated by the chart shows the growth of the consumer's investment in household electric appliances since 1924. This has been computed by adding together the total expenditures for new equipment, as reported by *Electrical Merchandising* and other trade papers, and subtracting, each year, the value of discarded appliances as estimated from tables covering average lives and average prices. It shows the net cumulative investment, *not* the cost of reproduction of the appliances in use at the current sales price.

The chart thus reflects the net effect of the growth in the number of customers, the increase in the appliances used per customer, and the change in the prices of the appliances themselves. The steady decline in the prices of several items, notably lamps, refrigerators and radios, which now cost about one-third of what they did fifteen years ago, has served to offset to a large degree the increase in the number of appliances in service.

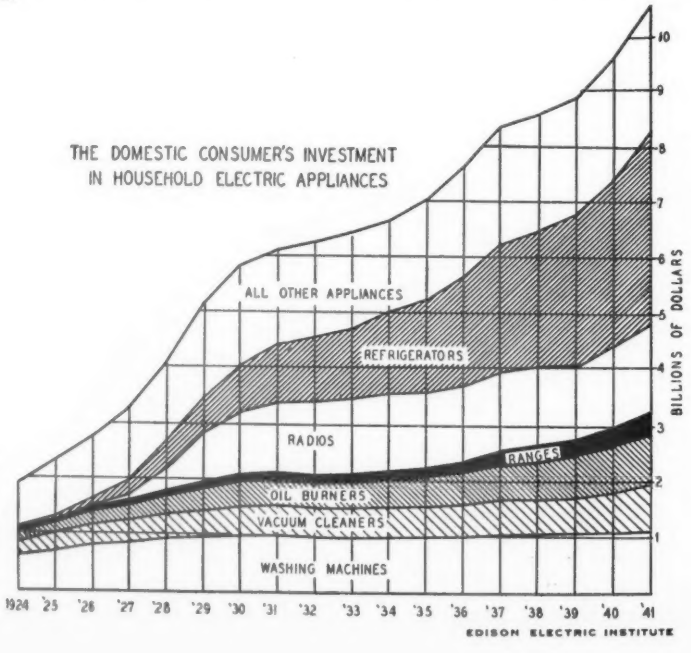
At the end of 1941, the average household had an investment of $396 in electric appliances (not including battery radios, wiring or lighting fixtures). The estimated annual mortality was 6 per cent, or $25. If we assume interest charges at 5 per cent of the investment, the domestic customer devoted, last year, $20 for interest and $25 for discarded appliances, or a total sum of $45 toward the fixed charges on his electric household equipment, which is $8 more than his bill for the electricity which he uses to operate these appliances.

It is noteworthy that ten billion dollars are now invested by the consumer in household appliances. If the cost of wiring and lighting fixtures were added, it is evident that the total would be in excess of the $15 billion dollars which represents the total fixed capital of all the electric utilities, public and private, in this country.

CONSUMERS' INVESTMENT IN HOUSEHOLD ELECTRIC APPLIANCES AND ANNUAL USE OF ELECTRICITY

	Total on December 31st			Kwhr Used		Annual Expenditures
Year	Customers* (Millions)	Investment (Millions)	Per Customer	Total (Millions)	Per $1 Inv.	for Equipment per Customer
1924	14,450	$1,950	$135.00	5,300	2.83	$ ....
1925	15,600	2,350	150.50	6,000	2.79	36.50
1926	16,825	2,800	166.50	6,950	2.70	38.50
1927	18,100	3,275	181.00	7,750	2.55	40.00
1928	19,250	4,050	210.50	8,725	2.38	55.00
1929	20,150	5,150	255.50	9,900	2.15	69.00
1930	20,525	5,850	284.75	11,150	2.03	50.50
1931	20,350	6,200	305.00	11,900	1.97	36.00
1932	19,850	6,300	318.00	12,050	1.93	23.50
1933	20,000	6,475	323.75	11,900	1.86	27.00
1934	20,600	6,750	327.50	12,825	1.94	31.50
1935	21,250	7,100	334.00	14,150	2.04	41.50
1936	22,025	7,675	348.50	15,900	2.15	54.25
1937	22,950	8,400	366.00	18,025	2.24	58.25
1938	23,525	8,650	367.50	19,850	2.33	34.25
1939	24,450	8,925	365.00	21,625	2.46	41.00
1940	25,500	9,625	377.50	23,800	2.57	52.25
1941	26,750	10,600	396.25	25,750	2.55	62.25

Note: *All residences and farms, excluding power used for irrigation pumping. This table does not include wiring and lighting fixtures, battery radio sets, flashlights, motor-driven work tools or special farm equipment.


THE DOMESTIC CONSUMER'S INVESTMENT IN HOUSEHOLD ELECTRIC APPLIANCES
ALL OTHER APPLIANCES
REFRIGERATORS
RADIOS
RANGES
OIL BURNERS
VACUUM CLEANERS
WASHING MACHINES
BILLIONS OF DOLLARS
1 2 3 4 5 6 7 8 9 10
1924 '25 '26 '27 '28 '29 '30 '31 '32 '33 '34 '35 '36 '37 '38 '39 '40 '41
EDISON ELECTRIC INSTITUTE

Lighting for Production

By John O. Kraehenbuehl

Professor of Electrical Engineering, University of Illinois

An address before the General Power Conference, E.E.I. Chicago, March 24-26, 1942

THAT adequate and comfortable lighting will increase production has been proven so many times that it is an accepted fact with those interested in factory management. During World War I it was definitely established that an illumination of 30 foot-candles would increase the number of pieces produced to a probable maximum because the worker under this level of illumination reached the limit of his psycho-physiological ability to merely produce more pieces. The question we face in World War II is not one of maximum production for a short period of time but the question of producing large quantities over a period of perhaps five or ten years. The endurance of the human being considered for long time high speed production accounts for a recommendation of higher foot-candles of illumination than those which would produce a maximum output only.

A report on one of the early studies of the question of production versus lighting, may be found in Public Health Bulletin No. 181 published in 1929, analyzing the work of letter separators in the Chicago Post Office. The most significant curve given is one of "Looking Time" and "Illumination" which was found free from improvement factor during the series of tests. The curve indicates rapid improvement with increased illumination up to seven foot-candles and then a very slow increase beyond that point. The effect in tabular form is given as:

Low Illumination	*Sorting Time*	*Distribution Time*	*Looking Time*
8 with greatest effect	28.0	13.7	14.3
8 with least effect..	22.1	11.8	10.3
Average Illumination			
8 with greatest effect	27.5	13.6	13.9
8 with least effect..	21.7	11.5	10.2
High Illumination			
8 with greatest effect	26.6	13.8	12.8
8 with least effect..	21.8	11.9	9.9

In these early experiments we see the effect of increased illumination in the production rate for all groups but a more marked improvement for the slower group. It must be remembered that an understanding of the control of light had not advanced to a proficiency equal to some of the poorest systems in use today.

MR. KRAEHENBUEHL

A continuation of the consideration of production alone is apparent in the ability to speed up reading with increased illumination. Expressing ability to read in per cent and comparing the effect of illumination on the rate, it is found that:

Foot-candles Illumination	*Per Cent Speed of Reading*
2	93
4	100
6	104
8	107
10	111
12	115
20	116
30	117

Neither of these studies takes account of the wear on the individual nor the character of the task. The task which reaches a maximum of production, where the reflection factor is 80 per cent, at 30 foot-candles cannot be compared with a task where the reflection factor is only 8 per cent, for in the last instance the individual will require approximately 300 foot-candles for maximum production.

Primarily, it is not a question of maximum production that must be considered but the question of *efficient production*. To produce the greatest number of parts over the longest period of time with the least exhaustion to the worker requires besides quantity of light, quality of light. *Efficient production* must be considered under the following sub-divisions:

Efficient Production

1. Production—the maximum out of every machine,
2. Spoilage—the minimum of spoilage,
3. Accidents—the fewest accidents to individuals or machines,
4. Visual efficiency—the best use of the eyes with the least strain,
5. Fatigue—the work period must produce a minimum of fatigue,
6. Health—the health must be good or efficiency drops,
7. Endurance—the fatigue of each day must be completely overcome by the rest period or the human being loses his efficiency at an increasing rate,
8. Morale—if the worker is to have the spirit of "do or die" he must not have his morale lowered by poor working conditions which sap his endurance and health.

Since it is possible by relatively simple tests to prove that illumination increases output, it next is necessary to consider if the correct quantity and quality of lighting will increase efficient output.

First, is even a small per cent of production increase worthy of consideration? The final measure of production in this emergency in which we find ourselves is man hours. It is not the dollars which our legislative bodies rush to appropriate nor the possibilities reported in raw materials and production but the actual man hours expended either at the front or in the factory. Across the writer's desk lies a blotter depicting the cost to the nation of night traffic accidents. The estimated total is 206,000,000 man hours each year which in turn represents the equivalent work required to produce 2000 heavy bombers, or six battleships, or 25,000 trainer planes. On a similar basis 2 per cent of production, regardless of how it is gained, represents an equivalent number of man hours and therefore an equivalent gain in battleships or planes toward war effort. This gain may be through a saving of material formerly lost in spoilage or by reducing accidents or because of any of the items listed under the tabulation headed efficient production.

Consider the first item, production, which means more parts, more complete items per hour or per year. A study of

Installation of 400-watt H-1 mercury lamps giving 40 footcandles in service.

14 reported cases showed an average increase of 10.5 per cent in production because of increased illumination. This increase ranged from a low of 2 per cent to a high of 25 per cent. By simple mathematics these percentages can be converted into war effort in planes or ships. The most conservative average of percentages or even the lowest listed percentage represents many man hours of productive effort.

The second item is spoilage, the loss of man hours and frequently the loss of precious metals which are impossible to replace. The average of the studies reported shows 23.5 per cent saved with a range of from 4 to 50 per cent, an appreciable saving of our productive reserve.

Accidents frequently mean human suffering, either mental or physical and sometimes both. Even if we measure these physiological and emotional factors as minor against the greater distress of the world as a whole we cannot discount the loss of man hours, the most needed item in our war effort. A skilled worker may be away from his bench for weeks or months, measuring many lost man hours and even greater may be the loss in man hours if a machine is damaged which otherwise would be producing on a 24-hour schedule. Improved lighting has been reported as reducing individual accidents 15 to 60 per cent and damage to machines 20 per cent.

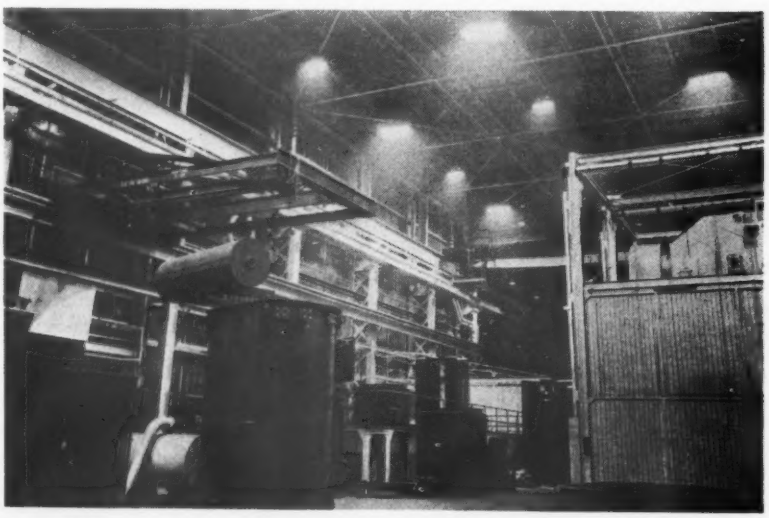
Visual efficiency has been studied by many researchers and the effect of illumination on visual efficiency has been frequently reported. In summary the illumination is more effective for those with defective vision and those known as the slower workers. The increase of illumination will affect the workers as follows:

Faster workers	28% increase
Slower workers	40% increase
Better eyes	14% increase
Defective eyes	22% increase

this is where the illumination has been increased from 3 to 12 footcandles.

It is recognized that age slows down the worker and also causes eye defects. However, the older trained worker is of the greatest value to industry, because of the experience and judgment gained through years of application to the specific task. During this period of emergency there must be a return to an older group as the man hour source for offensive and defensive material and equipment, because the younger workers will be called to combat service. It can therefore be expected that proper illumination will represent a higher percentage of man hour return than under normal conditions.

Two studies which have been published many times are an index to the benefits of illumination in reducing fatigue. A measure of the nervous tension under which the individual works shows that if the illumination is increased from 1 to 100 foot-candles the nervous muscular tension is reduced 32 per cent. A measure of the convergence reserve of the eye shows that if the illumination is increased from 1 to 100 foot-candles there is 16 per cent more reserve. The human, like any machine, has energy to produce a given output, but if this energy is dissipated through other than productive effort there will be a reduction in needed material and equipment. If with a reasonable rest period the worker is able to overcome the fatigue caused by work he will then be in a position to again return expendable energy in useful production. However, if the rest period does not restore the worker to his high productive state we consider that his endurance has been lowered. If our war effort must extend over a period of five to ten years it is of utmost importance that we make every effort to conserve the endurance of the worker by reducing fatigue to a minimum.



Installation of 3 kw mercury lamps, alternate with twin 1000-watt incandescent lamps, giving 50 footcandles in service.

The effect on health of proper lighting is an elusive topic to consider. The Edison Electric Institute, in one of its publications, reports that in one instance a factory clinic reported 30 per cent less headaches when proper illumination was installed for the tasks which were being performed.

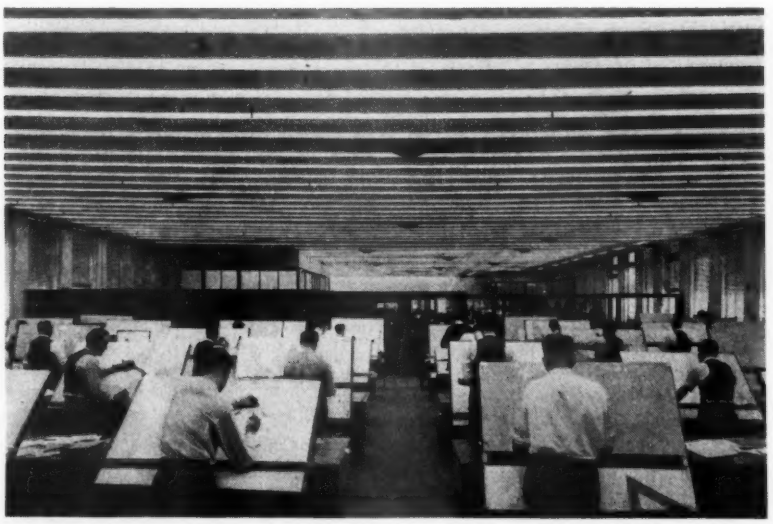
The final item, *morale*, would seem to be a sum total of the benefit gained from all other items. Morale stands for zeal, spirit, confidence, which cannot exist where the individual is fatigued or suffers from loss of wages through spoilage, accidents or slowed down production. It is necessary to maintain morale if the end result is to be victory and where lighting plays a major part for at least one third of the day and one half of the individuals waking hours, the factory management must consider it, if *efficient production* is to result.

The public and administrative heads have been so thoroughly educated to foot-candles in the last few years that there is a tendency to carry the matter too far. It has even been suggested that local lighting be used in production plants and all general lighting abolished as an air raid precaution. It is true that foot-candle levels may be maintained through local lighting but the quality of lighting will be very poor. It does not seem reasonable that a workman should be penalized for the greater part of his working hours because it may be necessary to have a "black out" for five minutes once in several months or even in several weeks. It is necessary that there be plenty of general illumination and in industry, vertical illumination. In no plane within the range of vision should there be brightness contrasts greater than 1 to 10 and it is better if these do not exceed 1 to 5. A good quality of illumination should:

Installation of 2-lamp fluorescent RLM's giving 40 footcandles in service. The supplementary lighting gives 200 to 500 footcandles at the point of work.

Quality Illumination

1. Give the proper horizontal and vertical illumination for the task.
2. Be free from direct glare.
3. Be free from reflected glare.
4. The lighting should be uniform.
5. The work surface and the task free from harsh shadows.
6. The surroundings should be properly illuminated.



A typical drafting room with conventional white painted troffers giving 60 footcandles in service.

The recommendations of the Illuminating Engineering Society should be used as a guide in designing the illumination level for the task. The specifications are very conservative and are the minimum allowable values for illumination. Proper recognition must be given to the specific task which must be performed, therefore, no hard and fixed rule can ever be applied, for design must be tempered with matured judgment when illumination and lighting equipment are being specified.

The items listed under *efficient production* can well be a basis for extensive research. The figures quoted in this paper are not the result of researches made by the author but from the published literature concerning the subject. Except for the items of production and fatigue little concentrated research has been directed toward finding out by specific means the true value of lighting in a continued production effort. If we had available as much reliable information on lighting and production as we have on night traffic accidents as influenced by lighting, we undoubtedly could show a man hour saving because of improved lighting which would belittle the figures previously quoted. If inadequate thoroughfare lighting costs us 206,000,000 man hours what will inadequate industrial lighting cost us in man hours? The logic of the situation points to a much larger loss because much more is involved.

It is customary to point with pride to our new installations where 40 or 50 foot-candles have been obtained with large areas of sources thereby improving the quality of lighting. It is too easy to forget the thousands of installations that furnish from less than one foot-candle to 2 or 3 foot-candles. The increased production available in bringing these from these low levels to the 30 foot-candle maximum production lighting, is overwhelming in consideration. To carry these same plants into the region of *efficient production* would add untold man hours each year to our war effort. It is the problem of the informed to obtain reliable data through controlled research and to educate the industrial management and government agencies in charge of production concerning the need for adequate and quality lighting in producing war equipment.

That lighting in the plant contributes to the comfort of the worker and increases production is proven by a subjective summary of the statements made by executives from twelve machine shops covered by a national survey. These plants had installed better lighting and the management reported advantages as follows:

Comments on Relighting
Machine Shop

	Percentage Improved
Lighting	
Less glare	67
Less shadow	83
More uniformity	58
Improved appearance	42
Benefits	
More production	67
Fewer rejects	67
Better quality	17
Fewer accidents	17
Greater efficiency	50
Better morale	50
Less eye fatigue	58

Though this information is subjective it does indicate, without setting up test standards and methods of evaluation, that the executives appreciate the fact that good illumination has a good general effect in the plant and on the output. It has been found from experience that when extensions or new plants are being built, where good lighting has been in use, the quality of lighting in the additions or expansion program is of an equal or better type.

There are many light sources available for industrial lighting and some of the newer sources have high efficiencies, making the cost of a lumen hour of lighting much more economical than ever before. Some recent typical industrial installations are as follows:

1. *Filament installation,* 100-w lamps in Alzak reflectors on 14 x 20 ft. spacing, giving 65 ft-c initial with a probable average of 40 ft-c.

2. *High intensity mercury lamps,* 400-w, giving an average of 40 ft-c. These lamps are efficient and give foot-candles at some of the lowest costs.

3. *Alternate mercury and incandescent lamps,* giving 55 ft-c of uniform illumination.

4. *Alternate 3 kw mercury and 1000-w incandescent lamps,* on 25 ft. centers giving an average of 55-ft-c.

5. *RF type mercury lamps,* on 10 x 10 ft. centers giving 30 ft-c.

6. *Two "white" 100-w type F lamps,* on 10 by 13 ft. centers giving 35 ft-c.

This information is not to be considered design data but indicates the various combinations of sources and the high level of illumination which is being used in those plants which may be considered to have installed modern lighting sources and equipment for *efficient production* lighting. The choice of source is varied and much depends upon economical considerations as to which installation would prove the better investment, but each illumination source is capable of doing a good job if it is properly used.

Installation of 40-watt fluorescent lamps in aluminum painted troffers, giving 30 footcandles in service.

Besides the manufacturing areas it is necessary to light adequately and correctly the offices and the drafting rooms because these two points are often the most important in the production program. The same rules apply to the draftsman and stenographer or order clerk as apply to the machine worker.

It is not the money which is appropriated which will give us the maximum of man hours but it is the use of these appropriations which will make available the maximum man hours in our war effort. Good lighting aids in increasing production and making this production efficient, therefore, there seems to be a good argument in favor of continued development and manufacture of lighting equipment and sources, with a minimum restriction on the use of materials in supplying war industry with this necessary tool of production.

Electrical Victory "V" Available

THE St. Louis Electrical Board of Trade has been given all rights to sponsor nationally, and to encourage the electrical industry to use and adopt an Electrical Industry Victory "V," a symbol emphasizing the "V" in the abbreviation, kva, and carrying the slogan "Victory is calling for Continuity of Power." It was originally designed and produced by the James R. Kearney Corporation, St. Louis.

Electrotypes of the symbol are available at cost; 1 inch, one color electro is 90c; 3 inch, 2 color plates are $2.25; 4 inch, two color plate are $3.00. Window cards 16" x 16" printed in red, white and blue are $2.00 per dozen, packaged and delivered.

Order and requests for information should be addressed to Mr. Carl H. Christine, Secretary-Manager, St. Louis Electrical Board of Trade, 1205 Olive Street, St. Louis, Mo.

Light for Protection

By E. P. Coffey
Federal Bureau of Investigation

An address before the General Power Conference, EEI, Chicago, March 24-26, 1942

YOUR real problem is to adjust your vast organizations to an *all-out* war effort . . . not a gesture or a token conversion . . . but a transformation of all power and energy into such channels that directly, or indirectly they constitute a mighty irresistible force that plunges on to Victory. The same intellectual giants and masters of organization that made your industry what it is today are the geniuses who can and must convert it into a war machine. The potential war power of this nation is unbeatable—defeat will only come because we fail to muster our resources—our every ounce of strength in the total war effort. Defeat will come because we selfishly tried to hoard comfort and convenience—or because we failed to lay aside our "long range plans" and thought too much about what we were going to do in business "after the war." If we don't win the war our plans for "after the war" are only empty dreams.

As Mr. Wheeler indicated, all non-essential power and energy must be transformed into essential effort. Of prime and immediate importance in this conversion comes Light. "Light for Production"—"Light for the Offensive"—"Light for Protection."

All of these are huge projects, greater than any you have ever tackled before—projects that will test your ingenuity and strain your organizations to the breaking point. Don't regard them as a new sales line to be peddled about in the usual manner. These are the tremendous needs of a great industrial nation suddenly forced into war and fighting for its existence. Into these projects you must put every bit of your skill and every ounce of your effort, because you are the only men who have the skill and the will to do such a stupendous task.

You are discussing several of these projects at other meetings. Our problem this afternoon is protective lighting.

In the past your industries have developed protective lighting as a safeguard against accident and against the trespasser. In planning lighting against the latter we have been governed in pre-war times by the relationship between the amount of the risk and the cost of the protection in each individual case. In war time this situation changes—to the usual casual or criminal trespasser is added the saboteur and the dollar value of the property guarded is no longer the determining scale—but rather, its value to the war effort.

MR. COFFEY

Light becomes the sentry of industry and transportation. It ranks with the best methods of protection and is particularly applicable to large areas. In conjunction with proper fencing and patrol systems it is nearly invulnerable.

As well as assisting the guard forces in production problems, light in protection has a psychological value that must not be overlooked. Darkness is the breeding place of crime and the ally of the attacker. Not only does light actually make the operations of the saboteur difficult, but its very presence frightens him and he would prefer to work elsewhere—in the darkness.

In crime detection, light becomes an important factor. I am reminded of an incident years ago, in which the police officers were investigating a crime committed in a dark cellar, filled with crates and boxes of every description. One of the officers had a flashlight in his pocket, typical of the kind we, too, often carry—a little yellow beam of light which hardly guided him in the dark cellar. With that one small flashlight three officers went around the cellar striving to find clues to enable them to solve the crime—naturally it could not be done.

A case in Mineola, New York, was just the opposite—where the Nassau County policemen had a large truck, mounted with powerful searchlights, lights which could be pulled off the truck by means of extension cords, long enough to guide them for several hundred feet away from the truck, with motor generators on the truck to provide power where current was not otherwise available. With 150 watt bulbs lighting up a similar dark cellar, the brilliant glare threw everything into relief, and easily brought to the trained investigator's eye any clues which were obtainable.

Protective lighting can be helpful before great damage is done . . . if saboteurs plant time explosives they can be detected in good time, if there is adequate lighting, before they explode . . . whereas they would probably not be detected in darkness.

In determining what needs the protection of light in war time, we are governed by two main factors—the importance of the product or place to the war effort—and then its vulnerability to attack. Sometimes we do a fine job protecting the major plants of war industry—the aircraft assembly plants, etc., and completely overlook their sources of parts and raw material and transportation—which, if damaged, would cripple the main plant as effectively as blowing it up.

Actually, when an enemy nation engages in a plan of sabotage, it is carefully engineered. The enemy studies the vital industries. He determines the small plants that make the essential parts—the sources of the raw material—the sources of power and water—and the transportation systems involved. These he will attack.

And so our problem of protection suddenly becomes far-flung. It is limited only by the amount of electric power that may be diverted to it, and by the ingenuity of our engineers in installing it. Cost is the lesser factor.

Conceivably, railroad bridges and railway rights of way, highways, locks and canals, may yet need protective lighting. Recent large scale sabotage in occupied France has demonstrated that railroads cannot be adequately protected by armed patrols alone. In the darkness of night, saboteurs with their faces blackened, lie in hiding just a few feet back from the railroad until the guard passes, then slip in and plant explosives before the next patrol comes by. So effective has this practice become in France, that the Germans became desperate and found the only effective way to protect the railways was to designate a highly regarded citizen to patrol the railroad, watching for sabotage, and the Germans blamed it on the guard, and shot him and his friends if explosives were planted in spite of the patrol. In the darkness, it is practically impossible to protect those rights of way.

And if you think that guarding railroads is a rather large order from the lighting standpoint, then consider the possibility that you might be called upon to guard an entire frontier or a coast line. That is not out of the realm of possibility—the new system of commando raiding as developed by the British depends mostly on the cover of darkness for its success. If he is unable to attempt large scale invasion of our country at this time, the enemy might attempt this form of hit and run raiding. If he does, light will defeat him.

In the last world war the Germans were confronted with a serious frontier problem after conquering Belgium. Holland was neutral, and was the headquarters of the British spies who passed information, refugees, and intelligence secrets across the frontier. The Germans tried patrolling the frontier and ended up with a series of electrically charged fences all along the frontier, which was illuminated by means of searchlights which rotated, moving up and down on a time cycle. As a result of that form of protective lighting, there came into existence on that frontier a type of person who specialized in crossing the frontier, carrying supplies, intelligence secrets, etc., by sneaking along and dodging the searchlights, then ducking into pools of shadow to wait for the light to pass over. So accurately did they work this out, that they even had maps and charts showing the pools of shadow . . . and were enabled to get over the frontier every night, in that manner.

I mention these huge projects (not that the need for all of them has yet developed in this country) to awaken in you an appreciation of what the magnitude of this thing can be. Actually it develops as the need arises, and as I have already pointed out, those things most valuable and most vulnerable are to be protected first.

Lighting protection takes several forms—from the engineering standpoint I am not going to discuss these because you gentlemen know more about it than I do. From the sabotage and attack angle, however, I can give you some pointers.

First of all, there's flood lighting as applied to large areas, such as railroad yards, which must have adequate coverage, to counteract operations of saboteurs who might otherwise be enabled to operate in pools of shadow.

Another type of protective lighting is the fence lighting, installed on a large scale, supplementing and giving added protection, in conjunction with patrols—this requires study and certain thought. Lighting should be used to protect our patrols, in order to work against the trespassers. Such lighting could become a boomerang, by pointing up our patrols and silhouetting them so they become targets for the enemy bullets.

Building exteriors present a new problem in lighting and flood lighting is suggested for building exteriors, to prevent illegal access to the building or attack from without by explosion or arson. Considering this form of lighting from another angle, there is the question of whether the exterior lighting will be on all through the night, or will they be under the control of the watchman, to be turned on or off at specific times, when needed, or merely held in readiness for an emergency, where such lights could be turned on to frighten off trespassers or to catch them. Another possibility is to have such lighting controlled by an automatic electric alarm, where a prearranged signal will turn on the lights. In crime detection, often this system is used in connection with catching a criminal, and even though no human is there, an accurate record is obtained by camera and illuminative lighting.

In addition to these well-known forms of lighting, we will possibly get another new type . . . lighting for camouflage purposes. This kind of lighting would play quite an important part in subsequent protective measures.

Another war time problem in protective lighting would be the arrangements necessary for blackouts. Arrangements would have to be made for registered control, in case lights would have to be put out . . . and it would be necessary to watch out so the area does not become a target, rather than a protected feature.

A lighting system, in itself, is vulnerable to attack and must be considered in the plan for protective lighting. Switches should be safe-guarded against any casual trespassers. Power lines must be safe-guarded and so protected that they will not be attacked from outside. In many installations you will want two, or three, or even more alternate power supply lines so that if one line is successfully attacked, the others can still be operated. They could be buried underground, for protective purposes—transformers must be watched so they are not hit by stray bullets. There are problems peculiar to each installation, and I am mentioning some of these dangers and hazards so that when you are planning to make other installations, you can take these precautions into consideration.

Those are some of the problems which are going to confront you, although for the most part the specific needs will be designated to you by the plant owners, by the military authorities, the government production authorities—as the needs arise. Then it will be up to you to solve each problem.

This then becomes one of your war assignments, and the skill and the energy with which you attack it will be actually the effort which you will put into achieving Victory.

"Subsistence Project" to Be Sold at Loss

ACCORDING to testimony at the hearings on the Agriculture Appropriation Bill before Congress, the 158 homes in the Arthurdale, West Virginia, "subsistence project" will be sold to the present tenants for an estimated price of $175,000; or $2,471,000 less than the original cost of construction.

The project was a "social experiment" in the early days of the New Deal and was constructed under the Resettlement Administration of Rexford G. Tugwell at a cost of $2,646,000.

C. G. Baldwin, Administrator of the F.S.A., which inherited the project from Tugwell's organization, told the House Appropriations Committee that the project, and others like it, had become "problem children." Testimony also developed that the operating expenses of all of the resettlement projects had been $13,442,000, while the income actually collected had amounted to only $8,105,000.

Outlook for Supply of Lamps and Lighting Equipment

By Don M. Julien

Director, Industry Relations Division, Foster & Davies, Inc., Cleveland

An address before the General Power Conference, EEI, Chicago, March 24-26, 1942

THE Outlook for the Supply of Lamps and Lighting Equipment is, like most other outlooks today, very much befogged. What I have to say to you is the result of nearly a year's effort to be of some practical help to various branches of the Lighting Industry, and to individual manufacturers in those branches in the matter of Priorities, Limitations, Procurement of Materials, etc.

I know how a great many of these manufacturers feel regarding the Outlook but I have no sources of information in Washington not open to any American citizen and if I seem to speak too positively, please forgive me. It is only because you would tire of hearing me preface every other statement with "I believe," "it is very possible," and similar qualifying phrases. You would like me to tell you what the Lighting Industry is going to be able to do, what types of equipment it will produce, where it may sell them, in what quantities, and for how long. Several thousand manufacturers of Lighting Equipment have been asking themselves those same questions and if I can tell you what already has happened to them, and what we think is likely to happen, you then can interpret these general trends in light of your own local and individual conditions.

It is usually dangerous to generalize about the Lighting Industry, for while it does have a common denominator in that all of its branches produce equipment that provides Light, the various elements making up this Industry have little more than that in common. In spite of this, however, I believe two generalizations are safe.

The first one, one you already have heard and will hear again and again, is that in the kind of a war we are fighting . . . a war of production . . . Light is as essential as bullets and battleships, for without Light the called-for 168-hour production week would be an utter impossibility. So Light, unquestionably, takes its place with Men and Munitions as a war implement of primary importance.

MR. JULIEN

If this is true, and I have never heard anyone attempt to disprove it, then we can proceed to a second generalization more pertinent to the subject, and that is that the people in the Lighting Industry are engaged in essential war activity, *but* only insofar as the Light they help produce serves a necessary purpose in our program for Victory.

Let us not assume that because Light is a war essential in certain places, it may be provided lavishly or extravagantly, and in *all* places. To use a homely parallel, while we continue to produce beans, and butter, and bread, we are getting along very nicely with less than our normal ration of caviar and Italian olive oil. It seems only a few weeks ago, that business men were shouting in gatherings like this, that trade-papers were editorializing, and Congressmen were orating on Capitol Hill, all trying to prove that business must be preserved, perhaps not quite as usual, but certainly to the extent that it could earn Profits out of which to provide Employment and pay Taxes. You don't hear nearly so much of that now, for it has become rather apparent that other, and more important, occupation has been found for labor and that while government still is glad to take whatever taxes it can find, it actually is in much greater need of the critical materials that so-called civilian business has been consuming than in its tax-dollar. Let's be very practical and realize that we are driving rapidly toward an all-out for Victory . . . that all previous conceptions of what is natural or normal or essential are being revised and the only sensible, not to say patriotic, justification for a product that is using critical materials, or needed machinery, is that it will help win the war.

But there's where the problem becomes complicated. Winning the war involves more than the production of planes, or guns, or bullets. The new and rapidly growing army of war workers has to be fed and clothed and housed, and in every one of these activities, Light is an absolute necessity.

In other fields, the service that Light performs is less important, and right now the problem facing Washington . . . and the Lighting Industry . . . is, where *must* we have light, what *kinds* and how *much* and, conversely, where can we do with *less* light or none at all and what *kinds* of lighting sources and equipment are involved.

Facing these questions, we can no longer generalize, but must examine each Branch of the Lighting Industry individually, for that's the way it is being treated in Washington, with just a wee bit of overlapping when End-Uses of the product become involved.

Christmas Lighting

In the eyes of many, perhaps the least important branch of the Lighting Industry is Christmas Lighting, but a different conception will be had when we realize that in 1941, one out of five of all bulbs sold in the United States, both large and miniature, was a Christmas Tree bulb. While this Industry had some difficulty late last year in getting certain materials, notably plastics and copper, the Christmas Lighting Manufacturers ended up in 1941 with the greatest sales in history. But Pearl

Harbor changed things completely, and even though the President and Prime Minister Churchill, in their Christmas Eve addresses to the nation, made reference to the morale-building importance of Christmas and lighted trees, before January had passed what was then OPM ordered drastic curtailments. The "control" in this case was the production of Christmas tree bulbs and this year, under L-28, the order limiting the production of Incandescent Bulbs, the Christmas Lighting Industry is reduced to about 30 percent of its 1941 production.

Some 17 manufacturers are engaged in the manufacture and making of Christmas tree outfits, wreaths, illuminated candles, etc. They have no equipment to convert to war production, yet there was no cry of unfairness or discrimination when the restriction was imposed and, right now, they are assembling what little materials they have on hand and then will shut down for the year and likely for the duration of the emergency. In a way, the Christmas Lighting Manufacturers are fortunate for at least they know the worst and are governing themselves accordingly.

Portable Lamps

Next, let us take a quick look at the Portable Lighting Industry. Over 600 factories . . . and I use the word "factories" advisedly . . . are engaged in the manufacture or assembly of Portable Lamps and Shades, ranging all the way from the 10c store items to exquisite designs selling for $5,000 and more. Obviously, not all of the Portable Lamps that have been made in the past were essential from the standpoint of the efficient production of Light for useful purposes, yet, on the other hand, in many vital spots today, Portable Lamps are the only, or at least the most practical, sources of illumination. The government seems to recognize this when it writes Portable Lamps into its specifications for war-production trailers, and when Portable Lamps are found to be the largest single item in the current proposals for electrical supplies issued by the Procurement Division of the Treasury. I believe that we are safe in assuming there will be a continued production of portable lamps but that the production will be much curtailed. What this curtailment will be, we don't yet know. Some time ago, an Industry Specialist from what was then OPM, addressed a number of manufacturers at the Chicago Lamp Show and told them that an order was being prepared which would limit the production of Portable Lamps to 80 percent of the 1940 volume. Since then, this percentage has been further reduced to 70 percent and other restrictions are added. The length of the cord to be used will be reduced, no more sockets may be used than 70 percent of those used in 1940, and of course, the copper order, M-9-c, prohibits the use of brass or copper for any purpose other than the conduction of electricity. After March 31st, plating is pretty generally prohibited by the various metal conservation orders and many lamp manufacturers already are building their lamps of glass and wood and pottery and almost completely eliminating the use of all metals, except for the socket shell, the cord and the plug. And it wouldn't be surprising, after manufacturers' stocks of plugs and wire are exhausted, to find lamps on the market without cords or plugs, on the assumption that many people wanting lamps will be able to find their own cord and plug to complete the job.

No very accurate estimate can be made of the quantity of finished lamps in the hands of manufacturers and retailers, or of the quantities of wire, sockets, etc., on hand for the manufacture of lamps. At present, manufacturers are able to take care of existing demands but when the limitation order is signed, production will be cut. In the meantime, those manufacturers who possess suitable equipment are going after, and getting, war orders. Others, who have been doing less of a manufacturing and more of an assembly job, are finding new things to make, not at all related to the Lighting business, and involving materials that are readily obtainable.

Residential Lighting Fixtures

So far, no restriction has been placed on residential fixtures, as such, but a limitation order is being discussed and even without such an order the general orders controlling such things as copper, brass, aluminum, nickel, steel, etc., already made it very difficult for fixture manufacturers.

Some manufacturers have done a remarkable job of designing, practically eliminating the use of all metals except for the socket and the wire but the type of residential building that will be going on, $6000 and under, isn't a very attractive market for fixtures. We hear that many thousands of so-called defense housing units are to be constructed this year, some figures running as high as 625,000 units. All of these units will have some kind of a fixture in each room but the total value of all the fixtures for a housing unit of this type usually is under $5, sometimes running as low as $3.25. Lighting fixtures likewise are being specified for the demountable housing units and here the amount involved is even less, approximately $2 per unit. There will be other demands for residential fixtures in barracks, air bases, and other military housing projects but these, too, are little more than sockets to hold a lamp, in fact they often are designated as "lamp-holders." Fixtures still are available for replacement purposes, but when the sockets and the wire that manufacturers have on hand are gone, there may not be any more available and now doesn't look like a very auspicious time for utilities to be thinking about a residential re-fixturing program.

Commercial Lighting

So far, we have made no specific mention of Fluorescent Lighting as such, but now it becomes necessary to treat this light source as separate from Incandescent. You all know the advantages and the disadvantages of Fluorescent Lighting, and I would say the advantages of soft, cool, glareless light, with materially less current consumption, are recognized and appreciated by WPB. However, it has one great disadvantage, that being that Fluorescent tubes and fixtures use quantities of several critical materials, principally mercury, copper and steel. The regulated frequency (RF) type of tube involves the use of several times as much mercury and copper as the F-type, and because of that at least one tube manufacturer already has announced that in a very short time he will discontinue advertising and promoting the use of this tube, manufacturing only a sufficient number for necessary replacement. And, the use of the F-type tube is certainly going to be restricted. An order has been drafted, and if not already approved is likely to be any minute, which will say that Fluorescent Fixtures may not be sold to, or purchased by, non-essential users. The order won't use the term "non-essential." Rather it will state what rating an order for fluorescent fixtures must have before it can be filled—likely an A-1-j, or an A-2, and the priorities division will establish what is essential and what is not by the ratings it assigns to orders for Fluorescent Fixtures. This pending "use" order likely will have these effects.

(1) Fluorescent lighting will be authorized for new construction when the object of such construction is war production.

(2) It will not be permitted as replacement for existing lighting installations unless such replacement would materially increase war production.

(3) There will be some new construction to care for essential civilian needs in new or expanding war-production areas. Lighting will be necessary in these new buildings but it seems probable WPB will reason that incandescent lighting would be entirely adequate for new food stores, barber shops and bowling alleys.

(4) It is expected that the sale of fluorescent tubes for replacement will be permitted.

I don't believe there will be any orders forbidding the use of *existing* fluorescent installations in stores, and windows, and for showcase lighting, except as increased demands on generating capacity may limit the use of light, both fluorescent and incandescent, for such purposes. But no new fluorescent installations can be made without a pretty high priority rating, after this order becomes effective.

I don't believe the Lighting Industry was very happy in its choice of the term "commercial" to describe a certain type of lighting installation. Certainly today the word seems to have a rather sordid connotation and lately there has been some talk of adopting a new designation such as "utility" or "utilitarian." But whether we continue the use of the old term "commercial" or find a new one, we need to be careful now, how we apply it for there will be more and more use of so-called commercial equipment in industrial applications. Under present terminology, lighting of offices, drafting rooms and other places is classed as commercial lighting yet if such lighting is regarded as essential to the operation of a war-production factory, it will receive priority recognition. We must not assume, therefore, just because a certain type of lighting fixture is termed a "commercial unit" that it will be placed under a ban. It is the End-Use, not the design of the fixture, that will determine its status.

There is another angle to consider in this so-called commercial field and that is the increasing restrictions on all non-essential building, the difficulty of obtaining copper wire and other wiring materials without the assistance of very high ratings, all of which tends further to limit the opportunities for commercial lighting promotions of all kinds—incandescent as well as fluorescent.

Industrial Lighting

When we come to this phase of Lighting, the picture is entirely different. The government will undoubtedly extend priority assistance to manufacturers of lighting equipment of all kinds when it contributes to the war effort and the government even is concerned as to whether the manufacturers of industrial lighting equipment will be able to meet the demands that will be made upon them. Some manufacturers, therefore, might feel that they have nothing at all to worry about, that the government will supply them with all the orders they can handle and with all the materials that these orders require. That is basically true, but there are one or two factors that should be considered.

Many things are being done differently since the War Production Board was created and today the mere fact that a certain piece of equipment is for an essential use will no longer confer upon the designer or the manufacturer of that equipment, the right to be extravagant or wasteful, either in the use of materials or of electrical energy. The users and the manufacturers of essential war equipment are going to be expected to apply all possible ingenuity in finding substitutes for critical materials or in using as little of these materials as possible, where no satisfactory substitute can be found. As more and more things are being taken away from civilians, there will be more and more obligation on government to use the things it takes wisely, and needless or inefficient uses of critical materials, including electrical energy, will not be countenanced simply because they are labeled "for war production."

I don't think it is necessary to do more than mention the remaining types of lighting equipment. Certainly flood-lighting is required, and will be provided, for the protection of essential manufacturing plants, transportation facilities, etc. Roads and streets leading to plants will be lighted, as will air fields, troop cantonments, etc. Explosion-proof installations will be provided where needed and the manufacturers of these types of equipment should be bending every effort, as doubtless they are, to make each pound of critical material give forth the utmost quantity of light.

So far we have talked mostly about equipment, but what about the light sources themselves . . . the bulbs and the tubes?

The fluorescent phase of the problem already has been mentioned for there the end-use of fixtures was involved. But, in addition, the mercury order, M-78, specifies that tube manufacturers may use no more mercury in any 3-month period than 100 percent of the mercury used in the first 3 months of 1941. In issuing limitation orders, WPB usually bases its computations on the year 1940, in the belief that this was an average, or normal year. But in 1940 fluorescent lighting was really just starting and in consideration of that fact, the first quarter of 1941 was used as the basis for limitation. There is considerable question as to whether even that period is typical or normal but, anyway, that is how the order was written.

Then I have mentioned the voluntary curtailment of the RF-tube with its comparatively greater usage of critical materials, and the pending End-Use order to prohibit the sale of fluorescent fixtures and accompanying tubes for non-essential uses. Weighing these curtailments and restricted uses, it is believed that the tube manufacturers can just about take care of the increased demand for essential fluorescent light and, at the same time, supply replacements for existing fluorescent fixtures of all kinds. This, of course, can't be an assurance but it is a prediction based upon the belief that materials will have to be released to provide the light needed in our war production efforts and that enough additional may be spared to provide tubes for replacement for so-called civilian use, but only where such use will not conflict with any restrictions on power.

Restrictions already are in effect on the production of Incandescent Lamps. Limitation order, L-28, issued late in January, forbids the use for the manufacture of lamps of more than 75 per cent of the nickel and 80 per cent of the brass and copper used for such manufacture in 1940, and the use of these metals for Christmas tree, advertising and decorative purpose lamps is even more severely curtailed. But, as usually is the case with limitation orders, the lamp manufacturer is told how much material he *may* use but there is nothing in the order giving him any priority rating or assisting him in any way to *get* materials. In other words, it tells him the quantity of critical materials he is permitted to use, *if he can get them.*

All this makes it very difficult to predict just what the year's output of lamps will be and I am afraid that some people are too optimistic. They have read about all the research that has been done by the bulb manufacturers, how they are brass-plating steel lamp bases and how they are nickel-plating steel wire, and from this they erroneously assume that the manufacturers can produce all the lamps they want to. Unfortunately, this is not true for while considerable progress has

been made in this direction, some very difficult problems remain to be overcome. Then it must be remembered that the status of the critical materials involved changes from month to month, and it doesn't seem now that these changes will bring any immediate comfort to lamp manufacturers. Restrictions on the end-uses of bulbs are being discussed and a very exhaustive study is being made to see what can be accomplished by the elimination of lamps of certain types, wattages, voltages, etc.

Trying to arrive at some kind of an answer, it is my opinion that incandescent lamps are in about the same position as the fluorescent tubes—that they will be readily available for war production and all of the civilian services necessary or important to war production, that normal replacements will be available but that it would be ill-advised at this time to advocate any greater use of bulbs where such greater use does not contribute directly to the winning of the war.

We have jumped around quite a bit and perhaps a brief summarization might be in order.

Christmas Tree Lighting

The quantity of bulbs available for use in 1942 is definitely established and in a few weeks will have been manufactured. There was a fair carry-over of bulbs and sets from last Christmas and this business this year will amount to around 35% of last year's volume.

Portable Lamps

A fair quantity of these will be required by the war effort and, if necessary, priority ratings will be given them. The Industry unquestionably will soon be operating under a limitation order with no priority assistance except in hardship cases. Consensus of opinion is about 50 per cent of last year's production will be available this year.

Residential Lighting

No specific limitation orders yet, but fluorescent will be hit and restrictions on copper, brass, nickel, aluminum, etc., now are keenly felt. Markets, too, are severely affected due to lack of residential building of the type that would use higher grade fixtures and the forecast for this branch of the Industry is considerably less than 50 per cent of 1941.

Commercial Lighting

Likewise to be greatly affected by scarcity of materials, by end-use orders, by limited building construction and by probable power limitations. This type of equipment has been obtainable without priority ratings, but most manufacturers, particularly those working with fluorescent, see their business dwindling to practically nothing.

A questionnaire recently sent out by one of the lamp and tube manufacturers to leading manufacturers of commercial type of equipment reveals (1) that securing critical materials is their major problem, (2) that they all have been working on the problem of substitute or alternate materials and that in cases where no satisfactory substitutes can be found, the particular item involved is being discontinued, (3) that about 30 per cent of this year's potential demand for commercial lighting equipment can be supplied.

Industrial, Flood-lighting, etc.

New military construction and conversion of old plants for war production will absorb all the manufacturers can produce. The problem here is how to get more light from smaller quantities of critical materials.

Bulbs and Tubes

Certainly all that are needed for the war effort and likely enough for essential civilian needs.

What should Lighting Companies do in face of such conditions? That is for others on your program to discuss, not for me, but I cannot close without saying this: No commodity, not even copper or steel, is more vital to our Program for Victory than electricity—electricity for Light and for Power, and yours will be the task of producing all the electricity that is needed, and the responsibility of helping to prevent the waste or the misuse of every possible watt of energy. This task and this responsibility will undoubtedly increase in importance and in difficulty, but you have faced other important and difficult situations before and you have overcome them, as you will this one.

While conditions, and therefore treatment of conditions, will vary among the Lighting Companies throughout the country, you will be as one in your determination to see this thing through as quickly as possible, and I am proud to be associated, if only indirectly, with an Industry that has so great an opportunity to do *so much* for *so many*.

Conserving Civilian Production

(*Continued from page* 137)

voted by Congress for the war effort and made available for spending by the Reconstruction Finance Corporation, came to sixty-four billions, three hundred twenty-nine millions of dollars. From Dec. 7, 1941, through March 5, 1942, seventy-two billions, six hundred three millions of dollars were made available, or a grand total of one hundred thirty-six billions, nine hundred thirty-two millions. Truly a stupendous outlay.

Donald Nelson, our War Production Chief, has pointed out: It matters not how we do the job, or who does it, or what it costs; what counts is that the right weapons reach the right soldiers at the right time. If we lose this war, the cost will not matter; and if we win —any price will be cheap.

Many outstanding and inspiring jobs have been done both in mass production and in "bits and pieces." One manufacturer turning out guns and doing it well, undertakes only 7 per cent of the work in his own plant. The rest is farmed out to smaller factories which can make required parts on existing machines. A group of small metal working establishments in Denver, Colo., banded together in a pool and have secured some seventy millions of dollars in contracts from the Mare Island Shipyard, for the fabrication of plates, frames and other structural metal work for the pre-fabrication of ships a thousand miles from the sea. A ladies' purse manufacturer is making parts for a gun; a merry-go-round manufacturer is making air-craft handling equipment; a heater manufacturer is making bogey-wheels for tanks—and so it goes. And in Detroit the automotive industry is doing an outstanding job, belying the statement that U. S. mass production, because of its single-purpose machinery, is not flexible and cannot readily convert. The mental muscles of its engineers are flexible, and their ingenuity is producing results which are amazing.

Yes, we'll do the job all right, despite our seeming conflict and confusion and we'll do it in the democratic way in which this great Nation has always met its emergencies. But it won't be without the greatest effort and sacrifice by all of us.

In conclusion, may I interject the

(*Continued on page* 156)

Maintaining Residential Usage by Our Customers

By A. C. Crandall

Vice President, Indianapolis Power & Light Company

An address before the General Power Conference, E.E.I., Chicago, March 24-26, 1942

AT the outset, let me say that the comments and suggestions which follow are not offered as complete answers to the problems involved in the assigned subject "Maintaining Residential Usage by our Customers." They consist mainly of ideas that have worked in our city, and others incorporated in future plans which we trust will work. Both are offered in the hope of stimulating better ideas in your mind.

First let's see if the objective of maintaining residential usage squares with the paramount issue of the day. Does it contribute directly or indirectly to the success of our country's war program—for if, as and when our actions or our objectives are not directed toward winning the war, they should be dropped. The answer we think is that maintaining residential usage of electric service not only contributes in many ways to our country's "all out" war effort, but if we were to cease our efforts in this direction it would actually be detrimental to those efforts.

The industry we believe has a direct obligation and responsibility to aid the homemaker in maintaining the present level of electrical living and to "save by the use of electricity," not just "save electricity." This conclusion would seem to be well supported in the report that England, during its two and one-half years of gruelling war experience, has never asked the domestic customer to curtail the use of electric service. This would seem to be strong evidence of the value of electric service in creating that great war asset "home morale."

But suppose the war lasts so long and war production becomes so great that it does become necessary to control or ration energy for domestic use. We still have an obligation to help our customer maintain his usage to the limit of existing restrictions, so that the sacrifice in home lighting and the use of labor saving appliances, brought about by these restrictions, may be reduced to a minimum.

There is still another obligation involved in this matter of maintaining residential usage and that is to retain much needed revenue to the utility. This is a direct benefit to the war program

MR. CRANDALL

because severe losses in residence revenue, in the face of heavy capital expenditures to met war demands, may seriously weaken the financial conditions of a utility, and certainly a company so weakened cannot be effective in carrying its share of the war load.

Residential Lighting

Residence usage can be divided into two general use classes—lighting and appliances. Let's consider lighting first.

War conditions in no way lessen or remove the value of eyesight conservation, whether it be in the home, the office, the store or the factory. Anything we can do to conserve the worker's eyes, is a step in conserving the most valuable tools used in either war or peace times. They are tools that cannot be replaced, therefore should not be impaired or destroyed by lack of care or protection.

The man or woman returning from a hard day's work at the factory, office or store should be able to relax under the most favorable conditions, and certainly that includes a properly lighted home. In fact it is safe to predict that the home will take on new importance beyond just a place for the family to eat and sleep. As the pinch on automobile use tightens and other forms of transportation become more congested, the family will spend most of its evenings at home enjoying home entertainment. This will be quite a contrast to the practice of most families who now seek their entertainment away from home and there are few additions, particularly considering the cost, that will contribute so much toward the acceptability and pleasure of this increased home life as the use of proper lighting.

Expand Dealer Interest in Light Conditioning

In seeking ways and means by which to do a better job in bringing the light conditioning story to the residence customer, we naturally think about what the dealer is doing in this direction.

Most of the department, furniture and some of the larger appliance stores display floor, bridge and table lamps, and occasionally you will find a store in this class with a Light Conditioning Center. But the small radio and appliance specialty shop rarely has a lamp display or Light Conditioning Center but we believe that both of these outlets can be induced to put more emphasis on the sale of domestic lighting equipment. In a good many cases the display area formerly used for major appliances is now available for lamps, and salesmen will welcome this line as an aid to keeping up earnings that are decreasing because of the lack of appliances.

Possibilities in Fluorescent Equipment

Perhaps this is the time for us to consider the introduction of fluorescent lighting in the home. It would stimulate the dealers interest in the entire subject of home light conditioning. Recent inquiries indicate that fluorescent tubes will probably be available and at least one manufacturer has a fluorescent lamp of neat design which carries the I.E.S. tag. If it becomes necessary to ration the use of electricity in the home—fluorescent lighting would provide an ideal medium by which the customer could improve the lighting in his home and still practice conservation.

Looking at it another way, fluorescent lighting probably would have been introduced in the home within the next

year or so had it not been for the war, which will serve only to delay its introduction—so it might be wise for the utility to introduce it in a proper manner.

The experience of fluorescent lighting in the commercial market has shown that it is possible to give the customer an entirely erroneous conception of the merits of such a new product. Much of this commercial lighting was sold on the basis of cutting the bill in half without giving the customer what he really needed, namely, more light—which in most cases could have been done at no increase. If fluorescent lighting is introduced into the home market on the same "billing cutting" basis, our progress toward proper levels of home lighting will be greatly handicapped.

Appliance Salesmen Take on Light Conditioning Equipment

Many months ago it became evident that the production of major appliances, especially the larger units, would be constantly reduced and ultimately stopped, therefore if we were to retain even a part of our appliance field salesmen it would be necessary to add something to their line to keep up their earnings. In the meantime our portable lamp crew, which was made up largely of young men, was almost wiped out by the draft, and the number of Home Service representatives had shrunk to about half, so we decided that the addition of a line of light adaptors seemed the best means of meeting these and probably more such changes.

We were fully aware that it would be no easy task to convert salesmen who had devoted years to major appliances, such as ranges, refrigerators and water heaters, to the sale of adaptors and portable lamps which they consider "a nickel and dime" business, but they were confronted with some means of maintaining their earnings and the Company with the need of additional personnel to carry the lighting story to the home. So we set up a training course, gave it to the men in a four day session, handed them a display kit, price sheets, etc., and launched them into the light conditioning business. Some grasped the opportunity quickly and have added to their earnings from $35.00 to $50.00 a month without interfering with their major appliance business. Of course there were others that were somewhat reluctant to adopt the idea, but this group is constantly growing smaller.

An interesting sidelight is the case of a supervisor, himself somewhat skeptical of the possibilities of this adaptor sales plan, who started out to see what he could do by cold canvass. He carried on for several days alone and then he went with various members of his crew. Now he will prove to you any day that he can average better than $2.00 per hour, on cold canvass, through the sale of conversion lighting equipment and portable lamps.

Home Advisors to Sell Lighting Units

For years our Company has had a force of Home Advisors, ranging from 25 to 30 girls, promoting Better Light-Better Sight by Demonstrations in the home, by group lectures, etc. They have never sold any type of lighting equipment except to occasionally shop for a shade or something of that nature to accommodate a customer. It has always been felt that selling would reduce the educational value of the demonstration work.

But times change, and a recent test conducted by our Home Service Department would support the conclusion that the customer would like the privilege of buying new equipment from the Home Advisor at the time of the demonstration. During this test, no commission or bonus was paid to the Home Advisor, nor was there any changes in her normal plan of work—other than being given a catalogue, price list and an order book and requested to take an order for such equipment as the customer might want to purchase.

The test showed an increase in installed wattage of 36 per cent in homes where equipment was sold at the time of the demonstration, as compared to the installed wattage in a similar number and type of home where a demonstration only was given. In the case of the homes having demonstration only, the wattage count was not taken for 60 days following the demonstration, in order to give the housewife ample time to purchase the equipment that had been recommended at the time of the demonstration. Another reason for asking Home Advisors to sell lighting equipment is the added convenience that it will bring to the customer as transportation problems make it more difficult for her to shop.

The test further showed that sales work did not handicap the number of calls that the girl can make per day—in fact they increased 15 per cent, and it is obvious that with the decrease in major appliance home demonstrating, she will have still more time for lighting work.

These experiences and others, which time doesn't permit reciting, we believe support the conclusion that the customers need and want better home lighting. Energy output through domestic meters in 1941, for lighting only, constituted less than 5 per cent of the total output for all service, so if we consider the importance of lighting as a conservation measure as well as a builder of good morale, it would seem very definitely up to us to find some way to promote better home lighting.

Step Up Better Light-Better Sight Advertising

The entire lighting effort should, of course, be supported by proper newspaper and other forms of advertising, in quantities equal or greater than has been employed heretofore. We propose to devote this advertising to educational rather than merchandise copy. We will appeal to the customer not to waste light but to use it when and in such quantities as is proper for the task, emphasizing such things as safety lighting in the home which would naturally include proper lighting under blackout conditions. Such advertising will do a great deal to encourage local dealers to put more emphasis on the display and sale of good lighting equipment.

Appliance Use

Now let's turn our attention to the younger of the domestic use classes, namely, the appliances. They parallel home lighting in importance by saving time, labor and material—all three of which are vital to the war program.

New appliances, both of the small and major varieties, will undoubtedly be reduced to a dribble or dry up completely, so ways and means must be found to keep in operation those now in the customers' home. Failure to keep them useable will deprive thousands of women of the help of these labor saving devices which now make it possible for them to devote much needed time to war activities, Red Cross and other forms of local relief work which must go on.

Womanpower is expected to take over all kinds of work which will take them out of the home. They will fill the places of thousands of men in factories, offices and stores, and perhaps even take up some forms of military service. Recently a bill was proposed that would register all women citizens from 18 to 65 for whatever war time service they are, or could be, fitted. Surely such a movement would be seriously hindered if we deprive the home of its electric servants, for the labor saving of such ap-

pliances as the washer, vacuum cleaner and others can be replaced only with a tremendous amount of manual labor and time, both of which might be employed to better advantage in direct war production.

The conservation of food, both in its preservation and preparation, is extremely important during the war period and perhaps for a considerable time afterward—so here again our industry has an obligation to aid our customers to realize the fullest advantages of the electric refrigerator in proper food preservation and of the electric range in conserving valuable food elements. Active support and cooperation with nutrition classes and similar educational activities is a contribution that we can make to this end.

Appliance Repairs Will Reach Large Volume

The volume of repair work both in the field and the shop required through the next two or three years if, as we expect, the supply of new appliances is shut off, and if we are to keep the appliances now in the customers' home in operating condition, will be far greater than most of us can imagine right now. For illustration, a recent spot check shows that in our city there are approximately 43 per cent of the refrigerators sold 10 years ago still in service. This would be about 4000 units. So if 50 per cent of these old boxes require a major service job sometime this year in order to prolong their life, it is very doubtful whether present repair facilities would be adequate. Every one of these old boxes present to that home a problem in food preservation unless facilities are available to keep them operating for the duration, and the condition will steadily grow worse because the number of refrigerators annually reaching their normal life span will correspond to the increase in the sales rate 10 years ago. A still better view of the size of this problem is gained by considering the number of washers and cleaners that will have seen 10 years of service this year, and our data indicates that we can multiply the refrigerators by two for each of these appliances.

Dealers Have New Opportunity in Appliance Repair Business

The need for appliance repairs, due to war time restrictions, will create a new business for the appliance dealers. Its income will go far to replace the former merchandise profit. It is our observation, however, that not many dealers have as yet recognized this opportunity or, if they have, they have been so discouraged at the possible difficulties it involves, as to do nothing about it. Some complain that they lack the capital; others that there is a scarcity of mechanics, that no parts are available and that the business cannot be made self supporting. While there may be some foundation for these fears, they are not insurmountable.

Many of the manufacturers have already launched service programs to train the dealer and his men in the proper method of caring for their appliances, and so far we are told that manufacturers will continue to furnish parts, as part of the war program. The utilities can do a great deal to help the dealer over these hurdles and certainly we should do everything within our power to support and encourage the manufacturers who are carrying on these service programs. Man-power may be the worst of all, for we can't expect to get young, skilled mechanics for this work, they are too valuable for war production, but there are older men available —men who have had mechanical experience or are the jack-of-all-trades type but cannot stand the pace of war production. Moreover, it is possible that women can be trained for a great deal of this work.

As a by-product to the dealer from the appliance repair business, he will earn a degree of customer goodwill unobtainable in any other fashion, plus a knowledge of the old appliances in his neighborhood that will form a preferred prospect list and enable him to cash in with quick sales the instant new appliances are available. It would cost thousands of dollars to build up such a prospect list by canvassing or advertising.

One of the schemes being employed to try and insure a profit from the repair business, is to acquire as large a stock of used appliances as possible to start with, then insist on getting an old appliance for each one of these rebuilt appliances sold. The trade-ins are laid aside and used to level out the mechanic's time load factor. This scheme provides two sales and in most cases a profit can be realized on each.

The local electric league or association can be of great assistance and we have heard of several communities besides our own where it is doing a splendid job toward selling the various branches of the industry in their community on the opportunities that war time conditions present.

One of the largest automobile sales and service outlets in our city is developing plans to enter the electric appliance repair business—adding it to his present automobile service business. This would seem to be a natural because he has certain fixed investments and expenses which must be carried on if he maintains automobile service for his customers, but this work is rapidly shrinking and something is needed to take its place. He has available plenty of bench tools, lathe, grinder, press and other equipment which is adaptable to appliance repairing. He has men in his employ who are not subject to draft and would like to stay with him. Certainly it is to his advantage to hold this organization together if possible.

Appliance Salesmen and Home Advisors Can Help

With adequate training the appliance salesmen and Home Advisors can take care of a good many screw driver and plyer repair jobs and they can be further helpful by referring the customers service needs to dealers that are properly equipped to handle them. This ties in with a couple of other ideas which are in the making, namely, salvaging worn out and scrap appliances, and the redistribution of useable but inactive appliances now in the customers' home.

Appliances and Lamp Bases Have Scrap Value

The idea of gathering old appliances of all kinds and descriptions, including burned out lamp bases, etc., for their scrap value as critical materials, is not original and we believe it has a great deal of merit—so much so that we would seriously recommend launching such a campaign on a national scale. Utilities would have to take the leadership, but all dealers could be tied into the program. It is possible that the work involved could be done on a cooperative basis so that whatever could be realized from the sale of this scrap would be turned over to the Red Cross or a local charity.

Redistribution of Inactive Appliances

The second of these two ideas is to convert into active use, appliances that are now inactive in the customers' home, either by reselling the customer on the use of the appliance or perhaps buy it with the idea of reselling it to some other family who cannot buy the item on the open market. After all, why should one family want for the need of an appliance that someone else owns but for some reason not using. When the supply of new appliances dries up, such a scheme

may be the source of a sizable appliance supply.

Combining the Work of the Appliance Salesmen and Home Advisors

In order to continue the widest possible customer contact, we anticipate the necessity of combining the work of the Appliance Salesmen and the Home Advisors. Under the present method of operation there is some overlapping in the territories assigned to the members of each of these groups, but as personnel shrinks, which we feel sure will happen, we propose to eliminate this overlapping condition and assign territories to each salesman and home adviser, in which each will be expected to carry on the work of the two departments, plus such other field contact work as may be assigned.

An Estimate of the Threatened Revenue

It is probable that we would all like to get some idea of the revenue loss that would result from appliances that may be taken out of service for want of adequate repairs and cannot be replaced by new equipment as in normal times. Such light as we are able to shed on this subject is taken from data gathered in a recent spot survey of approximately 1,700 typical middle class residential customers. It would be boresome to recite all of the statistics developed from this survey, but a few of the highlights are interesting and for convenience the data have been translated to the basis of 1,000 customers.

The survey covers ranges, water heaters, refrigerators, I.E.S. lamps and 10 other of the most commonly used appliances—which total 8,397 appliances or practically 8.4 units per home. Of this number 57 per cent were less than 5 years old; 27.4 per cent were 5 to 10 years old; and 15.6 per cent were more than 10 years old. However, 762 appliances, or approximately 9 per cent, were not in active use. Of this number, 205 were out of service for need of repair and 557 for some other reason. This last figure supports the idea that some means should be found to redistribute, to those who need them, appliances that are in good condition in the customers' homes but not in active service.

The survey showed that the number of appliances not in use increases rapidly with the age of the appliances. Those in need of repairs went from .7 of 1 per cent for those one year old to nearly 6 per cent for those 10 years or older, while the rate for appliances in good condition but not in active service rose from 2.3 per cent for the year old to 15 per cent for those that were 10 years or older. Considering that these increases have occurred under normal conditions, when the appliances could be repaired or replaced, it is safe to assume that the rise will be much more rapid when replacements are impossible and repairs are more difficult to obtain, unless we make some definite effort to keep them in service.

To arrive at an estimate of the usage by classes of appliances, we estimated the kilowatt hour use per appliance based upon the estimated kilomatt hour consumption of each appliance as given in the E.E.I. BULLETIN in February, 1941, with the exception of ranges, water heaters and refrigerators. In the case of these three appliances we took our known saturation, multiplied by the annual kilowatt hour consumption and divided by the total number of customers:

Average per Residential Customer Per Year

Lighting	333 kwhr
Range	127 kwhr
Water heater	117 kwhr
Refrigerator	267 kwhr
Other appliances	282 kwhr
	1,126 kwhr

From this breakdown we find that 30 per cent of our consumption is from lighting, while 70 per cent of it is from appliances, and if we grant that these figures are reasonably accurate, it follows that the major part of the task of Maintaining Residential Usage lies in continuing all existing appliances in the hands of the customer in active use.

If we assume an average of 10 year life per appliance in use, it would be possible to experience, based upon the kilowatt hour usage as already quoted, a drop of 10 per cent in appliance use, or 79 kilowatthours per year per customer. In actual practice the figure wouldn't be as high as this immediately, because many appliances can be used beyond a 10 year life—many of them could be partially used even though they needed repairs and still others would fall short of their 10 year age. So to be conservative, we might reduce this by 50 per cent or say 40 kilowatthours per year per customer, which, if valued at 2½c per kilowatthour, would mean a loss of $1.00 per customer per year, and because of the pyramiding effect would be $6.00 for a three year period or $15.00 per customer over a 5 year period.

This naturally prompts the question of how much we should spend to minimize or prevent experiencing a loss of such proportion. The answer, of course, lies with each Company. However, it is safe to say that the cost of retaining customer usage will be only a fraction of what it will cost to regain it—particularly if we lose with it a large block of our customer goodwill.

We might say in conclusion that probably despite our best efforts, residence usage will shrink during a long war period, but that shrinkage will come quicker and be much greater if we adopt lukewarm methods or cease entirely our constructive efforts toward maintaining maximum usage consistent with war interests. Therefore, granting that electric living is in the interest of winning the war, our problem is to develop ways and means to help our customers maintain their essential electric service under the restrictions of war.

It doesn't seem necessary or even desirable for the utility to attempt this entire job alone. It presents new business opportunities for dealers, contractors and other industry branches, but the utility has a sales job ahead to awaken some of these people in time. Moreover, we must bear in mind that in the final analysis the customer will place in our lap the responsibility of maintaining proper service, including his appliances, at least within the restrictions of war.

POSITIVE DISCONNECTION OF DISTRIBUTION CIRCUITS DURING FAULTS TO GROUND

E.E.I. Pub. J-1. Engineering Report No. 47. A report of the Joint Subcommittee on Development and Research, Edison Electric Institute and Bell Telephone System, 36 pages. Price 60 cents to members and their employees; $1.50 to non-members in the U.S.A.; $1.60 to foreign countries.

THIS report gives the results of a study of means for insuring positive disconnection of distribution circuits during faults to ground, particularly from the standpoint of coordination of telephone facilities which are jointly supported on the same poles with the higher voltage distribution circuits. The report includes a brief discussion of important factors involved in providing protection for telephone circuits during contacts with distribution circuits, a consideration of the factors involved in applying ground relaying to distribution circuits, the results of extensive oscillographic observations on the characteristics of distribution circuit ground faults and the performance of distribution circuit protective devices, as well as a number of other matters which have a bearing on the problem of deenergizing distribution circuits under ground-fault conditions.

Holding Customer Good Will Under Emergency Conditions

By Edwin Vennard

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An address before the General Power Conference, EEI, Chicago, March 24-26, 1942

IN these critical times, the electric industry should face all of its problems (including this problem of Customer Goodwill) from the standpoint of what is the best policy in attaining the nation's primary objective of winning the war. The electric business is a vital one in achieving this objective. In the solution of the many problems in carrying out this purpose, there are many respects in which the public at large may be affected. An informed public is an understanding public. An understanding public is friendly. One of the industry's primary duties then is to keep the public adequately informed about the business, especially so since it vitally affects the public interest.

What are some of the problems that may affect electric customers and how should companies proceed to give their customers the facts about them? No attempt will be made to enumerate all such problems, nor to list all the ways in which the facts can be presented. Rather, it will be the purpose to name a few as illustrations only.

Through careful planning, the businessmen who manage the hundreds of electric companies furnishing 90 per cent of the electric power in America, have interconnected their facilities one with the other to form a huge, high voltage transmission grid system covering practically every section of the country. Consequently, when the great emergency arose, high quality electric service in large quantities was available even in isolated villages. There was five times the capacity available as during the last world war. Power plant reserves enabled the electric companies to meet almost every demand over-night. With a few minor local exceptions, electric customers have not yet been inconvenienced by power rationing.

However, demands for power continue to increase and it is difficult to predict how high these demands may go. New capacity is being installed at the rate of about 2½ to 3 million horsepower a year. However, because of limited turbine manufacturing capacity,

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electric companies will not be able to secure all the generating equipment they may need and would like to install. Although the manufacturers of generating equipment are doing all they can, there is a limit to the rate at which such machines can be made. And there are other demands for such machinery in carrying out the war effort. Consequently, it may well develop that there will be some shortages of power in some localities and the regular users of electric service should be prepared in advance for such an eventuality. The personnel of the commercial departments who are so familiar with their customers and their needs are the best qualified to do this important work.

Each company, of course, is best qualified to determine how to meet its local situation. In areas where shortage of capacity seems probable, it is advisable for the electric companies to take the initiative and bring about voluntary curtailment in the use of capacity for purposes essential to the war effort. Power and commercial customers should be classified. Some customers may be able to operate almost as well during off-peak hours; others may be able to stagger production with curtailment of use during certain peak hours; others may be able to decrease their peaks by rearrangement of operating schedules. If these measures do not prove sufficient, it then becomes necessary to limit each power customer to a certain per cent of his requirements and in this case some official order will probably be required before proceeding.

It is recommended that each company equip itself with suitable protective clauses in its rate schedules, terms and conditions, and contracts in order that the customers may be adequately informed of the company's official standpoint.

In addition, however, it would seem advisable for those companies facing this condition to inform their customers now by some appropriate means, either by personal contact, or letters, or advertisements.

In addition to the possibility of capacity curtailment, some customers may be inconvenienced through inability to make, or delay in making, service extensions. Others will be inconvenienced by inability to obtain merchandise, or repair parts.

Because of these probable inconveniences to customers, and probable lack of customer understanding, it seems to be the consensus that in the interest of the public, and the companies, some form of commercial organization should be maintained to advise customers with respect to the use of their equipment for longer life and for the conservation of capacity.

Beyond the problems already mentioned, there is another problem which the electric companies must face and about which, in the interest of the war effort, customers should be kept adequately informed—the problem of business versus political management of the electric utility industry. There are those who believe that the public could best be served if the electric companies of America were operated and managed by individuals and agencies other than the businessmen now managing the companies. The issue is one involving a broad social change which should be set aside during the present emergency. The advocates

of both schools of thought should approach each individual phase of the power question with the one thought in mind: "How can we serve the needs of the present emergency most effectively with the least use of strategic material, men, and money?"

Unfortunately, there does not seem to be unity of thought on this point even in face of the emergency. A recent Congressional investigation disclosed that some of the advocates of a change from the business to the political management of electric companies are continuing their efforts and prolonging the controversy despite the war emergency. I refer to House Report No. 1873 of the Special Committee No. 3 on Materiel, Procurement and Personnel of the Committee on Military Affairs, of the House of Representatives which report deals with the activities of Rural Electrification Administration in building and planning duplicate transmission lines and generating plants. The Committee finds in part:

"That the Rural Electrification Administration is planning and projecting many large transmission and generating projects as necessary to the war program, which are not necessary, which duplicate existing facilities and waste tremendous amounts of copper and other critical materials. The Committee condemn such projects, and further find that, unless Rural Electrification Administration is checked in its effort to thus dissipate and waste copper and other critical materials, the progress of our national defense will be hindered and retarded seriously.

"That the Rural Electrification Administration does not add a single kilowatt of energy to that which is now in existence, and now available to the furtherance of the war program for the manufacture of aluminum.

"That the Rural Electrification Administration is misleading the public by propaganda, claiming their duplication of existing power systems is necessary to the war program."

If the company management knows of instances where such duplication and waste occurs and is a hindrance to the war effort, then it falls clearly within its duty to present the facts not only to the responsible agencies in Washington, but to the public at large.

(In passing, it should be noted that electric companies do the public and themselves an injustice by referring to this issue as one of "public vs. private ownership." In a very real sense one is as much public ownership as the other. Millions of the investing public have their money in the existing electric companies. Through their representatives, they have employed businessmen to operate and manage the companies. This is the method commonly referred to as "private ownership." It is an unfortunate term because "private ownership" to many people is understood to mean ownership by a few wealthy families, or Wall Street, or international bankers.

On the other hand, the method of operation commonly referred to as "public ownership" means ownership by the people and operation by some governmental agency or bureau which by the very nature of a democratic, two-party system is subject to political change. The real difference is not one of ownership, but one of management: On the one hand management by businessmen who represent the investing public and on the other, management by a political bureau. Electric company employees, in their conversations, letters, news articles and periodicals may well refer to their method of operation as it really is—operation under business management, and refer to the other method as it really is—operation under political management.)

Public Information

Because the public is entitled to all of the facts about the electric business and because a well informed public is an understanding public, electric companies should consider the manner in which they can most effectively and economically present facts to the people. It is fortunate for us that in the past ten years research on presentation of information to the public has become more scientific. There has been an amazing improvement in methods by which public attitudes may be accurately measured. Dr. Gallup, through his famous Gallup Poll, has done much to perfect this science. This method of using small cross-section samples, enables a determination with a high degree of accuracy of not only what people think, but why they think as they do. It is possible to determine what information customers now have about the electric business, wherein that information may be contrary to the facts, what facts should be presented, and the manner in which they should be presented to carry out the obligation to keep the public informed.

WHAT ARE SOME OF THE BELIEFS?

Many such surveys have been made. No attempt will be made to enumerate them nor to list all of the attitudes that have been found. Only a few will be mentioned for purposes of illustration.

Most of these surveys have resulted in one singular and important finding and that is: Practically all of the unfriendly attitudes toward electric companies can be traced to an absence of knowledge of the facts.

1. Ownership

The people are not wholly aware that the public interest is best served when there is little or no duplication of facilities in those types of industry requiring relatively large investments, for each dollar of gross annual revenue. Electric, gas, telephone and water companies fall into this category. The public interest is protected in such cases by governmental regulation. This is the plan under which the electric companies have been operated successfully all these many years It is the plan that long experience in the business indicates is to the public's best interest as opposed to competition (in the sense of duplication) and as opposed to operation by governmental agency. Under the present method, the customer who feels he is wronged has redress by calling upon the government as regulator. If the government operates the business, then there is no independent agency to which the customer can appeal for redress.

There is need for informing the public better as to who the investors are, how the business is operated, how and why it is regulated by governmental authority so as to avoid wasteful duplication, why it is to their best interest for businessmen who have made, and are making, this their life's work to continue its efficient management.

2. Rates

Measurements have been made with respect to the public attitude toward the price of electricity as compared to the price of commodities sold by other major industries. This measurement is important for comparative purposes: first, because the cost of electricity in the home is one of the smallest items in the family budget and, second, because the average household electric rate is now only about 50 per cent of what it was 15 years ago. Few other commodities can match that record. An analysis of the answers of "too high" in reference to electric rates indicates a lack of knowledge of the fact that the average rate is now only about 50 per cent of what it was 15 years ago. The customers' bills have not been cut in half; therefore, they conclude that the rate is not materially lower. These people do not realize that because of the many additional benefits they are receiving from increased lighting, small appliances, vacuum cleaners, washing machines, refrigeration and the like, they are using more than twice as much elec-

tricity as they were 15 years ago. In other words, these people do not know that they can now obtain about twice as much electricity in the home as they could 15 years ago for the same amount of money.

There is a need for making these facts more generally known in order to correct the erroneous impression that little progress has been made in reducing the average cost of electricity in the home. There is need to make it more generally known that this is a real accomplishment and is a direct result of careful planning and efficient management by the businessmen who run the electric companies together with the effective action of the local and state governmental agencies which through regulation, are looking after the public's interest.

3. Taxes

With respect to the amount of taxes paid by the electric companies, it has been found that almost half the people think they are "not enough" or "none" or "don't know." And yet the electric companies of America are now paying about $500 million a year in taxes.

These enormous taxes help support local, state and federal agencies and would have to be paid by the people in some other way if a fundamental change is made in the method by which electric service is furnished.

The public should be informed correctly about the taxes that they pay when they pay their electric bill and how their interests are involved.

4. Service

There is an almost universal belief that service is excellent and there is a fear that it might be poorer if a fundamental change is made. This high quality of service didn't just happen—it is no accident. It is a direct result of careful planning by the well trained and experienced men who originated, have operated, and now operate the business. For the public's benefit and information, experienced business management, which the public seldom thinks about, should be associated with the acknowledged high quality of service that they receive every day.

5. Government Dams

Most people believe that a dam can be used both for effective flood control and dependable power supply. Knowledge and experience in the business teaches that this is not a fact. A reservoir that is not full is required to store the excess waters and prevent floods; therefore, for effective flood control, the water in the reservoir should be kept at a low level. However, water at a low level in a reservoir cannot generate dependable electric power. The two are incompatible. Believing that the same dam can be used for both purposes and in addition for irrigation, navigation, prevention of soil erosion and the like, it is easy to see how some people would be in favor of the government building these dams whereas they might not be if they were rightly informed with respect to the facts.

Upon further questioning, it is found the people believe that if the dam cannot be used both for dependable power supply and effective flood control, a large majority would then choose that the dam be used for flood control.

There is present, therefore, the opportunity as well as the obligation, to present the public dramatically with the facts. The electric companies, by and large, have not opposed the construction of dams for the legitimate purposes of flood control, irrigation, navigation, prevention of soil erosion and the like. Likewise, it is recognized that the building of these dams for such purposes is the function of government. It is also realized that incidental electric power is inherently available when such dams are in operation and that this power is the property of government. However, it is a different kind of power from that available from a steam plant. Power available from a multiple-purpose dam is secondary in nature and cannot be used for firm power purposes, but is of value for peaking purposes and for dump or secondary power when operated in conjunction with a large, interconnected transmission system with sufficient steam plant capacity to operate as base load plants. Consequently, most electric companies have offered to purchase this secondary power (or firm power where it may exist) from the governmental agency in charge of this operation and have offered to pass on any and all savings through such purchase to the consuming public. This method avoids wasteful duplication, permits operation of the dam for its primary purpose (other than power generation), and gives the public the benefit of any and all savings.

Unfortunately, most of the governmental agencies followed the policy of selling the power from the dams direct to the public, thus lowering the usefulness for flood control and duplicating many existing facilities.

There is also a general belief that water power is always cheap power. As a matter of fact, experienced engineers know that with present fuel economies in most cases steam power is cheaper because of lower investment per kilowatt of firm power and because a steam plant can be located nearer the load centers, thus saving further in transmission investment.

Because the public's interest is involved and because these dams affect the electric companies' business and in turn their service to the public, the companies need to present the people with the facts about them, being careful never to minimize their value for their legitimate purposes but pointing out clearly their limitations for power generation when they are used for other than power generation purposes.

In regard to dams already built, or under construction, any opinion of their having been built contrary to public interest should be forgotten. Winning the war is the first consideration and all generating capacity should now be used jointly to obtain the maximum power available. To accomplish this, therefore, every endeavor should be made to work out with these agencies in charge of the operation of these dams a practical plan for bringing them into a common power pool.

6. Rural Electrification

There is a belief in some quarters that the electric companies are opposing the farm electrification program when they oppose the building of duplicate transmission lines by REA. The electric companies, by and large, have cooperated with REA and the rural co-operatives in their program of extending electric service to rural areas too thin to be served as a business enterprise. Evidence of this co-operation is found in the widespread sale of electricity at unusually low wholesale rates to rural co-operatives from existing electric transmission systems. In most cases these rates are fixed by competent regulatory authorities and are known to result in costs lower than the costs would be in a group of co-operatives banded together to serve themselves from a separate generating plant and a duplicate transmission grid system. The electric companies have opposed the construction of these duplicate transmission lines and plants not only because it would result in the waste of strategic material and money, but because it would be contrary to the farmers' own interests. The use of copper for such transmission lines means just that much less copper available for farm lines.

However, the public does not clearly distinguish between a high voltage transmission trunk line extending from town to town and load center to load center and a low voltage distribution farm line. Consequently, opposition to the duplication of transmission lines is sometimes interpreted as opposition to the farm electrification program of constructing retail distribution lines. There is a need to distinguish clearly for the public the two types of lines and to inform the public clearly of the fact that this duplication of the grid system is contrary to general public interest and also contrary to the interest of the farmers.

HOW TO INFORM THE PUBLIC

Each company, of course, can best determine how to present the facts about its particular business to its customers. A few suggestions will be made here.

1. *Employees.* A well informed personnel is one of a company's most valuable assets. There is one employee for about each 80 customers. To many customers some particular employee is the company. If employees are well informed about company affairs, the economics of the business, the facts about the industry as well as the local company, they will not only be better employees because of the training, but will be able to render better service to the public and will be able to keep the public better informed. Many companies have a well prepared, well organized employee information program under an experienced director.

2. *Commercial Organization.* The commercial employees who will now call upon the customers to discuss electric service in general have an opportunity to inform the public with respect to the facts about the business.

3. *Bill Inserts.* Electric companies have an opportunity that is absent in most other businesses to inform the public. In most cases we have a stamped envelope going to each customer every month. A bill insert is an economical and effective means of presenting the facts to our customers.

4. *Local Advertising.* With little or no merchandise to sell, local advertising may now largely be devoted to giving customers the facts about the business.

5. *National Advertising.* To a certain extent the facts about the generation and distribution of electricity are common to practically all electric companies in the country. To this extent, very effective and economical use may be made of the national media in giving these facts to the public so that the people may realize the public benefits resulting from the efficient business management of the electric companies. At the present time 63 electric companies having a total of about 5,000,000 customers are participating in a national advertising program. The number of participating companies is increasing with increased understanding of the economy and effectiveness of the program and the benefits both nationally and locally. This program is in no way intended to replace any local advertising program. It costs the average company about 10 to 15 per cent of its advertising budget. Under the present program a full page black and white advertisement is appearing once a month in each of the following magazines: *The Saturday Evening Post, Collier's, NewsWeek, Life* and *Time*. As more companies participate, it is planned to add a national radio program to the magazine program.

The five magazines in which the ads are now appearing have a combined circulation of about 10,000,000 and a combined readership of about 50,000,000. By scientific measurement, the electric company advertisements rank near the top for total readership when compared with all of the advertisements of equal cost appearing in the magazines. This is indicative of the public interest.

These five magazines reach 28.9 per cent of all American families.

Radio sets are owned by: 90 per cent of all urban families, 81 per cent of all village families, and 62 per cent of all farm families. On an average Sunday evening between 7 and 11 p. m. 39 per cent of all radio sets in the country are turned on and people are listening in those homes. A good radio program will reach 15,000,000 people a week.

Each electric company contracts directly with the advertising agency, N. W. Ayer and Son, Inc., Philadelphia. A voluntary committee of electric company advertising men works with the agency in the preparation of the ads. A voluntary group of operating company executives approves copy.

SUMMARY AND CONCLUSION

We are facing and will continue to face throughout the emergency many problems. Let us endeavor to solve them with one primary purpose in mind—winning the war. It is important as never before that we keep the public well informed about our business and how its operation affects their interest. It is not sufficient to give good service at reasonable rates through courteous employees. It is our duty to tell the public the facts about our business and its relation to winning the war. Let us cooperate with all agencies in the war effort and especially those having something to do with the generation and distribution of electric power. Let us endeavor to inform the public in advance of any possible rationing of electricity.

In carrying out our program of public information, let us do so as efficiently as possible by measuring public attitudes to determine not only what people think but why they think as they do, so that we can correct, if possible, any wrong impressions about our business. Having made this determination, let us then seek out the most effective and efficient ways of presenting the facts and then let's carry through the program.

Let us remember that practically all unfriendly attitudes toward the electric companies can be traced to an absence of knowledge of the facts. Let us never fear the consequences of telling the truth.

Conserving Civilian Production

(*Continued from page* 148)

hope that in fighting a world war for the second time within a generation, we will profit by our repetition of experience. May we recognize once and for all when this tragedy is over that we, as the greatest nation on this earth, cannot shirk the world responsibilities that our position thrusts upon us. May we realize that we can no longer idly stand by in assumed isolation, while the old world tears itself to bits in strife.

We know, as we never knew before, that might does not make right—but we know equally well, that right needs might. The great vision of hope for mankind for which Wilson gave his life is again before us. The historic Atlantic Charter consummated by President Roosevelt and Prime Minister Churchill dedicates the effort of the free men and women of this world to insure that their aspirations will not again be destroyed. This time may we learn, that in our aspiration lies our preservation.

With this hope ahead we turn our every strength to the immediate job in hand. It is tougher than anything this nation has ever yet attempted. It can't be done by resolutions or popular songs or letters to the editor. It can and will be done by the conversion of civilians to soldiers, factories to arsenals, and butter to guns. That is the task at hand.

Electricity Will Help Fill Freedom's Market Basket

By P. T. Montfort

Research Associate, Agricultural Engineering Department, A. & M. College of Texas

An address before the General Power Conference, E.E.I., Chicago, March 24-26, 1942

SINCE the beginning of an organized program of farm electrification, more than twenty years ago, much emphasis has been placed upon the utilization of electricity in the productive enterprises of the farm. The pioneers in this field quickly recognized that the farm was not only a place to live, but a small self-contained industry, engaged in the production and processing of raw materials into a wide variety of finished or semi-finished products for consumption both on the farm and in national or international trade. They realized that the whole problem of farm and farm home electrification would be simplified if electricity could be put to work so as to increase net income.

The electric service companies, manufacturers of electric equipment, farmers, the agricultural colleges, and many other agencies have devoted a tremendous amount of time, money and effort to the development of equipment and practices which increase the efficiency of farm operations. These have been made available to and have been put into operation by many thousands of farmers throughout the country.

At no time has the fundamental soundness of this program been more apparent than today, when the American farmer is confronted with the problem of drastically increased production in the face of a rapidly decreasing labor supply.

The primary contribution of the American farmer to winning the war will be the production of food, not only for himself, but for our armed forces, for those engaged in the manufacture of munitions and other war materials, for those carrying on essential civilian activities, and to supplement the food supplies of our allies. He will also produce many raw materials, including fibers and oils, which will be used for clothing and for industrial and war materials.

Farm production goals for 1942 represent an overall increase of all commodities of approximately 19 per cent above the five-year average 1936-40. Some of the increases in food production as compared to this base period are as follows:

MR. MONTFORT

	Increase over 1936-40	Total 1942 production
Milk	17.2%	125 billion pounds
Eggs	23.5%	4.2 billion dozen
Hogs	31.2%	83 million head
Beef	12.5%	28 million head
Chickens	16.6%	644 million

These increases in production demands are accompanied by a decrease in the available supply of farm labor. In 1941 there were 462,000 less laborers employed on the farm than during the five year period, 1936 through 1940. With the increase in production it now appears that agriculture is faced with a labor shortage of approximately one million man-years in 1942.

In attempting to evaluate the importance of electric service to the farmer in meeting his food production quotas, we must recognize that it is an immediate problem, to be measured in the light of facts and conditions as they exist today, and not as a long time program, which might be worked out over a period of years.

The following questions, therefore, are of immediate interest and significance:

How many farms have electric service today?

What is this service contributing to the productive effort on these farms?

What electric equipment is now in use on American farms?

What equipment will be available in the near future?

What substitute or make-shift equipment is feasible?

How can the rural service departments of the electric companies, dealers and agricultural colleges be of most assistance to the farmer in using his electric service most effectively?

More than one-third of the 6,000,000 American farms are now using central station electric service. The scarcity of copper and other critical materials prohibits the immediate extension of lines to additional farms on any very extensive scale. However, there are approximately 1,000,000 farms, not now using service, located within one-fourth mile of existing lines. Service can be extended to these farms with a minimum outlay of materials when justified by their contribution to the food production program.

Farms with electric service have a reliable, economical source of light, heat and power for use in the production, processing and preservation of food on the farm and in transit to the consumer. More than two hundred uses for electricity in farm production have been proven practical under actual farm conditions. These uses may result in lower labor requirements per unit of output, greater production per man-hour, the elimination of waste, or an improved quality of the product to be marketed. A detailed examination of a few of the more important applications will serve to indicate the value of electric service to the individual farmer:

Power Applications

Perhaps the most important single use for electric power on all types of farms is for water supply. An automatic pressure system with water piped to the farm home, yard, milk room, dairy barn, poultry house and other points where it may be needed, will save labor and time and will increase the quantity and quality of the farm output.

From three to five hours per day would be required for one man to pump the water consumed by the cows and

used for cleaning the barn and utensils on a fifty cow dairy. Two hours of man-labor per day would be required to pump and carry water for 1,000 laying hens. This labor would be valued at less than one cent per hour, when measured in terms of the cost of doing the same job with an automatic electric water system.

Cows with a constant supply of cool, clean water available at all times will produce eight to fifteen per cent more milk containing five to ten per cent more butterfat, than cows receiving water only once or twice daily. A constant supply of fresh water in the laying house will increase egg production eight to ten per cent.

The proper cleaning of dairy barns, milk rooms, utensils, poultry houses and poultry equipment is almost impossible without water under pressure.

In no section of the country are natural temperatures ideal for the preservation of perishable foods, such as milk, cream, meats, poultry products, fruits and vegetables, unless they can be marketed or consumed within a few hours after production. Electrically operated refrigeration equipment will prevent much of the loss, will save labor in handling and will assure the delivery of the products in prime condition.

With an electric milk cooler, the temperature of the milk can be reduced to a safe point within one hour after it comes from the cow, and the temperature can be held within this safe range until delivery to the distributing company or to the consumer. The labor saved with electric equipment as compared to other types, is one to two hours per 1,000 pounds of milk. Losses due to increases in bacteria are eliminated. The cost of operation is only one-fifth to one-third that of other methods.

The annual loss to poultrymen and farmers because of the lower quality of eggs delivered from the farms in the United States during the summer months has been between fifteen and twenty per cent. These losses are due almost entirely to improper cooling on the farm and in the small rural buying centers. All of this loss can be eliminated through the proper use of inexpensive electric cooling equipment, which may be of the evaporative type or mechanically refrigerated, depending upon the area and climatic conditions.

Refrigeration equipment, including frozen storage facilities, now available to or in use on many farms makes possible an almost complete "live at home" program through the preservation of meats, fruits and vegetables produced on the farm. The value of this service has been estimated at seventy-five to one-hundred-fifty dollars per farm per year.

The electric milking machine will replace three hundred man-hours of labor per month for each fifty cows milked. The use of this piece of equipment permits the dairyman to maintain present production with less labor, or he can increase production with his present labor supply. Still another possibility is that he can maintain present production of milk, and at the same time shift part of his labor to the production of other essential products.

The utilization of home grown feeds by the dairyman, poultryman, and livestock producer requires a tremendous amount of labor and equipment in handling and pocessing these foods. Electric power, when properly applied, will materially reduce the labor requirement and the cost of feed grinding and mixing, ensilage cutting and elevating, hay chopping, hay drying, corn shelling, grain handling and hay hoisting.

Heat Applications

Electricity is a clean, efficient, fireproof, easily controlled source of heat which is needed in many phases of farm production.

Because it can be accurately controlled within narrow limits, electric heat in the farm incubator will produce a twenty to thirty per cent better hatch than kerosene or hot water units. This means that for each one hundred eggs set, the poultryman will have twenty to thirty more chicks.

Electrically heated brooders are free from fire hazard, do not consume oxygen or give off objectionable fumes. They are easily controlled automatically and will save labor and decrease mortality when used with chickens, turkeys, lambs, or pigs. The labor required to brood chicks with electric hovers is one-fifth to one-third that required with fuel-type equipment. Losses from the death of young pigs or lambs dropped during cold, rainy weather can be practically eliminated with simple inexpensive electric brooders.

One of the primary causes for low-grade dairy products is the use of improperly cleaned or unsterilized utensils. The automatic electric water heater and electric sterilizer will provide hot water for cleaning and heat for sterilizing at a considerable saving of labor with no increase in operating cost.

With the growing shortage of transportation facilities, there is a rapidly increasing interest in equipment for removing surplus water from fruits and vegetables. Electric dehydrating equipment is now available in a wide range of sizes suitable for use on any farm.

When the temperature of the drinking water is near or below the freezing point, live stock and poultry will not consume enough to maintain both body requirements and the needs for normal production. A simple inexpensive electric heater installed in the water troughs will prevent periodic drops in production during cold weather. An electric water warmer in the laying house will increase annual egg production by twelve to fifteen eggs per bird. A water warmer for dairy cows will increase production ten to fifteen per cent when outside temperatures are below 35°.

Lighting Applications

Much of the work around the farmstead is performed before daylight, or after dark. This is particularly true on the dairy farm. With the present shortage of labor, the farmer's work-day will be lengthened still more. Good light in the farm buildings and in the farmyard will save twenty to thirty per cent of this "after dark" time and will reduce the danger of serious accidents.

Good lighting in the milk room and other locations where food is processed will encourage cleanliness, thus eliminating loss or improving the quality of the product to be marketed.

The use of lights to lengthen the day in the poultry laying house during fall and winter months will increase egg production during this period, thus tending to offset the peak production normally experienced during the spring and early summer months. The increased production during this period of high prices will bring a net profit of fifty to sixty cents per day for each one hundred hens.

Many applications of infra-red and ultra-violet light contribute to increased production on the farm by promoting animal growth.

Electricity in the Farm Home

The importance of farm home electrification in a program of increased farm production should not be overlooked nor under-estimated. The farm woman normally spends considerable time helping with outside activities. Her role will certainly become increasingly important as farm labor decreases. Good lighting in the home, running water, the electric refrigerator, range, laundry equipment and the many other household appliances will relieve her of much drudgery and save at least twenty to thirty per cent of the time required to perform the neces-

sary household tasks. This saving may reach a total of four to six million hours daily.

Cost of Electric Service

In this emergency it is often necessary to sacrifice cost to gain speed and volume. However, it is gratifying to note that electric rates now in effect throughout the country are such that the great majority of the jobs about the farm home and the farmstead requiring light, heat or power can be done as cheaply or cheaper with electricity than with other types of fuel or power. The over-all cost of electric appliances and equipment compares very favorably with other types.

Equipment Now in Use

There are no figures available which show the exact amount of electric equipment now being used in the productive enterprises on American farms. However, the results of a number of surveys, covering considerable areas well distributed throughout the country give a fairly accurate indication of the national situation.

To cite one example with which I am personally familiar:

A recent detailed survey of four hundred farms carefully selected to represent a true cross section of the 50,000 farm customers of the electric service companies in Texas, shows that 99 percent of all farms have radios, 96 percent have irons, 72 percent have household refrigerators, 52 percent have washers, and 22 percent have electric ranges. Eighty-eight percent of the dairies are using electric milk coolers; 52 percent are using milking machines, and 18 percent have electric water heaters. Fifty-three percent of the poultry farms and 24 percent of all farms are using electric brooders; 52 percent of the poultry farms are using lights to increase egg production; 82 percent of the dairies and 24 percent of all the other farms are using electric water systems.

An analysis of available data indicates that American farmers now have on hand more than one billion dollars worth of electric appliances and equipment.

New Equipment

Just how much new equipment will be available in the immediate future is, of course, uncertain. The Federal Government has recognized the importance of electrical equipment in food production and has made provisions for the farmer to secure a limited amount of that equipment which is absolutely essential to the operation of the farm.

Manufacturers of farm machinery have been assigned a priority rating of A-3 and have been given quotas of critical metals and rubber for the manufacture of new machines and repair parts in 1942. Some of these quotas (expressed in percent of 1940 production or sales) for electric equipment are as follows:

Milking machines	206%
Cream separators	213%
Milk coolers (immersion type)	150%
Churns	144%
Brooders	115%
Water systems (jet type)	142%
Hammer mills	100%
Repairs—all types	150 to 200%

Farmers have been given a priority rating of A-10 for repairs to machinery and equipment.

As the War Program progresses, there is certain to be some adjustment and revision of these figures, so as to maintain the necessary balance between the production of food and the production of other civilian needs and war supplies.

Substitutes

The ingenuity of farmers, rural service representatives of the electric utilities, the agricultural colleges and other agencies has already developed ways and means for making many substitutions for the critical materials ordinarily used in many applications of electricity to farm jobs. Certainly additional substitutions will be worked out. One good example of what can be done is the homemade electric brooder in which wood is used in place of metal for the entire canopy. Ordinary incandescent lamps are being used as a source of heat in these brooders as the supply of wire heating elements diminishes.

Another example — refrigerated storage rooms and freezer chests can be built commercially or locally with a minimum of metal requirements. All-purpose farm refrigerators, with walk-in chill rooms of 350 cu ft and built-in freezer compartments of 25 to 50 cu ft now operating satisfactorily on many farms require a minimum of critical metals. The storage compartments are built entirely of wood and insulated with a low-priced, readily available, non-critical material. The only metal involved is for door hinges and fasteners and a few pounds of nails.

The only copper used in the refrigeration system is that in the condenser on the compressor, the tubing leading to the cooling coils and in the controls. The coils in both compartments are made of a less critical material, thin-walled steel tubing.

Other homemade or locally made equipment involving substitutes for critical materials include egg coolers, all types of refrigeration equipment, dehydrators, feed mixers, grain elevators, circulating fans and soil heating equipment.

Care and Repair of Equipment

The maintenance, care and repair of farm equipment is one of the important phases of any successful farm operation at any time. Under conditions of material and equipment shortages, such as those existing today, a systematic program of servicing and maintaining existing equipment becomes imperative.

Helping the farmer to secure maximum benefit from his electric service under present conditions presents an opportunity and challenge to the rural service representatives of the electric companies, the agricultural colleges, dealers and manufacturers, to further justify a service which has already earned the respect and confidence of the farmer.

It appears likely that the most effective educational and promotional programs will be directed along the following major lines:

Stress those uses of electricity which contribute most to the food production program.
Assist the farmer in securing the limited amount of new equipment which will be available.
Help farmers to operate present equipment in the most efficient manner.
Encourage systematic maintenance and service of equipment.
Assist farmers in securing repairs for equipment.

Changed conditions will cause some revision in the method of contacting farm customers. It has long been recognized that the most effective method of assisting the farmer with his electrical problems is through personal visits by the rural service representative. Limitations in personnel and transportation facilities will seriously curtail such activities in the future. It will be necessary to resort to a more extensive use of the mail, group meetings and demonstrations, fair exhibits, and other forms of "mass selling."

Closer cooperation between electric service representatives, dealers, extension agents, vocational teachers, and farm organizations will eliminate much overlapping of effort and will certainly result in a better understanding of mutual and individual problems.

We may rest assured that the American farmer, with the aid of his nine million kilowatts of electric equipment already installed, and an annual use of more than three billion kilowatthours of electric energy will meet his responsibility toward winning this war in the shortest possible time.

SEVERAL CLASSES OF DIRECT DAMAGE INSURANCE CARRIED BY REPORTING COMPANIES

As developed by Questionnaire of 3/5/42, distributed by Insurance Committees of American Gas Association and Edison Electric Institute

KINDS OF INSURANCE CARRIED	ATLANTIC SEABOARD			SOUTH CENTRAL			NORTH CENTRAL			PLATEAU			PACIFIC COAST			CANADA			TOTAL		
	Less than 100,000 Meters	More than 100,000 Meters*	Total	Less than 100,000 Meters	More than 100,000 Meters*	Total	Less than 100,000 Meters	More than 100,000 Meters*	Total	Less than 100,000 Meters	More than 100,000 Meters*	Total	Less than 100,000 Meters	More than 100,000 Meters*	Total	Less than 100,000 Meters	More than 100,000 Meters*	Total	Less than 100,000 Meters	More than 100,000 Meters*	Total
Fire	8	61	69	7	27	34	2	42	44	0	8	8	4	11	15	1	9	10	22	158	180
Extended Cover	6	15	21	7	3	10	1	11	12	0	0	0	3	4	7	0	0	0	17	33	50
Riot and Civil Commotion including Malicious Mischief and Vandalism	4	39	43	1	20	21	1	27	28	0	5	5	4	7	11	1	7	8	11	105	116
Riot and Civil Commotion without Malicious Mischief and Vandalism	2	9	11	1	3	4	1	4	5	0	0	0	0	0	0	0	1	1	4	17	21
War Risk	1	1	2	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	2	2	4

THE COMBINATIONS OF THE SEVERAL CLASSES OF DIRECT DAMAGE INSURANCE CARRIED BY REPORTING COMPANIES

As developed by Questionnaire of 3/5/42, distributed by Insurance Committees of American Gas Association and Edison Electric Institute

KINDS OF INSURANCE CARRIED	ATLANTIC SEABOARD			SOUTH CENTRAL			NORTH CENTRAL			PLATEAU			PACIFIC COAST			CANADA			TOTAL		
	Less than 100,000 Meters	More than 100,000 Meters*	Total	Less than 100,000 Meters	More than 100,000 Meters*	Total	Less than 100,000 Meters	More than 100,000 Meters*	Total	Less than 100,000 Meters	More than 100,000 Meters*	Total	Less than 100,000 Meters	More than 100,000 Meters*	Total	Less than 100,000 Meters	More than 100,000 Meters*	Total	Less than 100,000 Meters	More than 100,000 Meters*	Total
I (a) Fire Insurance Only	1	10	11	0	4	4	0	7	7	0	3	3	0	1	1	0	1	1	1	26	27
II (a) Fire Insurance (b) Extended Cover	1	3	4	5	0	5	0	4	4	0	0	0	0	3	3	0	0	0	6	10	16
III (a) Fire Insurance (b) Extended Cover (c) Riot and Civil Commotion including Malicious Mischief and Vandalism	3	4	7	1	0	1	0	3	3	0	0	0	3	1	4	0	0	0	7	8	15
IV (a) Fire Insurance (b) Extended Cover (c) Riot and Civil Commotion without Malicious Mischief and Vandalism	1	8	9	1	3	4	1	4	5	0	0	0	0	0	0	0	1	1	3	16	19
V (a) Fire Insurance (b) Extended Cover (c) Riot and Civil Commotion including Malicious Mischief and Vandalism (d) War Risk	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
VI (a) Fire Insurance (b) Riot and Civil Commotion including Malicious Mischief and Vandalism	0	34	34	0	20	20	1	24	25	0	1	4	1	6	7	0	7	7	2	93	97
VII (a) Fire Insurance (b) Riot and Civil Commotion without Malicious Mischief and Vandalism	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
VIII (a) Fire Insurance (b) Riot and Civil Commotion including Malicious Mischief and Vandalism (c) War Risk	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	1	2	3
Total	8	61	69	7	27	34	2	42	44	0	8	8	4	11	15	1	9	10	22	158	180

* Including individual companies of less than 100,000 meters but which are part of a system aggregating 100,000 or more meters.

A
H

Gas Electric Corporation

A Survey of Various Classes of Direct Damage Insurance Carried by Electric and Gas Utilities

By Reginald Fleming
Commonwealth & Southern Corporation
Member Insurance Committee, EEI and Insurance Committee AGA

EARLY in March a questionnaire was circulated to a representative list of electric and gas utility companies by the Insurance Committees of the Edison Electric Institute and the American Gas Association, with the object of determining the practices of these companies in carrying certain forms of direct damage insurance. It was not the purpose to ascertain all of the kinds of insurance carried, but only those which might be directly concerned with loss of, or damage to, the physical properties caused by circumstances arising out of the present unusual conditions, such as war risk, riot and civil commotion, malicious mischief and vandalism.

Replies have been received from 180 companies, classified as follows:

Class of Operations	*Companies Having Less Than 100,000 Meters*	*More Than 100,000 Meters**	*Total*
Gas Operations only	15	63	78
Electric Operations only	2	53	55
Combination Gas and Electric Operations	5	42	47
Total	22	158	180

(*Including individual companies of less than 100,000 meters but which are part of a system aggregating more than 100,000 meters).

Some of the companies do other than a gas and electric business, but such other operations are not reflected in the analysis.

The results of the survey are indicated in the tables on the opposite page. The states comprised in the geographic classification used are listed in the third column on this page.

A brief general description of the several classes of direct damage insurance carried by reporting companies follows. An exact description of the coverage may be obtained from the provisions of the policies and their endorsements directly.

Fire Insurance

Covers against all direct loss and damage by fire but is not liable for loss or damage caused directly or indirectly by invasion, insurrection, riot, civil war or commotion, or military or usurped power.

Fire—Extended Cover

This coverage is by endorsement to the fire insurance policy. It enlarges the coverage under the fire policy to include direct loss and damage due to windstorm, cyclone, tornado, hail, explosion, riot, riot attending a strike, aircraft, smoke and vehicle damage. For a full explanation of the coverage reference should be made to the policy, but for the purpose of this memorandum there is given hereunder a limited description of the explosion, riot, and riot attending a strike coverage.

(a) Explosion

Excludes explosion originating within steam boilers, pipes, flywheels, engines and machinery connected therewith and operated thereby.

(b) Riot and Riot Including a Strike

Covers direct loss or damage by riot or riot attending a strike. By endorsement coverage may be extended to include willful or malicious physical injury to or destruction of the insured property not in connection with a riot.

There is no liability for loss due directly or indirectly to bombardment, invasion, civil war, insurrection, rebellion, revolution, military or usurped power or by operations of armed forces while engaged in hostilities (whether war be declared or not) or by civil commotion arising from any of the foregoing.

War Risk or Bombardment

Covers against all physical loss by (1) war, whether declared or not; (2) invasion; (3) civil war, insurrection, rebellion or revolution; (4) military or usurped power; (5) bombardment, naval or military; (6) aerial craft (hostile or otherwise) while engaged in active war service during war time, including bombs, shells or missiles dropped or thrown therefrom or discharged thereat; (7) fire and/or explosion directly caused by any of the foregoing, whether originating on the premises or elsewhere. There is no liability for loss (among other causes) due to pillage or looting, clandestine acts, acts of individuals or groups not committed during and in connection with operations of military or naval armed forces in the country where the insured property is situated, confiscation, nationalization, expropriation, requisition, commandeering, capture, seizure, sequestration, or detention by or under the order of any government or political subdivision of the country or state in which the property is situated.

Riot and Civil Commotion Without Malicious Mischief and Vandalism

Covers against direct loss or damage to insured property caused by riot, riot attending a strike, occupation of prop-

(*Continued on page* 165)

GEOGRAPHICAL CLASSIFICATION OF STATES

Atlantic Seaboard States
Connecticut
Delaware
Florida
Georgia
Maryland
Maine
Massachusetts
North Carolina
New Hampshire
New Jersey
New York
Pennsylvania
Rhode Island
South Carolina
Vermont
Virginia
West Virginia
Washington, D. C.

North Central States
Indiana
Illinois
Iowa
Kansas
Michigan
Minnesota
Missouri
Nebraska
North Dakota
Ohio
South Dakota
Wisconsin

Pacific Coast States
California
Oregon
Washington

South Central States
Alabama
Arkansas
Kentucky
Louisiana
Mississippi
Oklahoma
Tennessee
Texas

Plateau States
Arizona
Colorado
Idaho
Montana
New Mexico
Nevada
Utah
Wyoming

Canada
All Territories

Value of Industrial Nursing Services in Small Industries

By Phoebe Brown, R.N.

Industrial Nursing Division, Employers Mutual Liability Insurance Company of Wisconsin

One of a Series of Articles Sponsored by the Accident Prevention Committee of the Edison Electric Institute.

PRIOR to the time that legislation was enacted to protect the workman, the average employer concerned himself merely with the replacing of the injured or ill by new workers, taking the attitude that his responsibility ceased with the termination of the workers usefulness, regardless of the cause. A few other industrialists more social minded looked about for means to remedy this condition. Out of the realization of this need, the first steps in legislation and organization to protect the worker came into existence.

Compensation laws for industrial workers were first established in 1884 by Germany, in 1887 by Austria, and in 1895 by Norway. The first effective compensation laws were passed in the United States in 1911.

Up until 1900 there were as far as is known only three nurses employed in industry in this country. The first was at The Vermont Marble Company in 1895, the second at The Employees Benefit Association of John Wanamaker's large department store in New York City in 1897, and the third by Fred Loeser in his department store in Brooklyn, New York. These three groups all started in different ways and followed different procedures but all started because of the need of nursing service to the worker and his family and the need of first aid treatment of his injuries.

There are now approximately 3500 industrial nurses in the United States. With the increased demands for production, there is ever a greater need of well trained public health nurses not only in the large, well established plants but in the smaller industries as well. The small plants are badly in need of better medical programs but until recently little thought has been given to the problem. When we stop to consider that benefits paid under compensation laws of this country annually are approximately $400,000,000 and that time lost due to non-industrial illness costs the employer fifteen times as much as his compensation, it is time that we study the health and welfare of the worker more closely.

There is a tendency on the part of management to consider that the services of a nurse are not warranted unless full time services are indicated. Is there any reason why a part time nursing service cannot be worked out for a group of small industries conveniently located? In some communities visiting nurse associations have been called on to service the individual plants on an hourly basis. The amount of time necessary to service any one plant is based upon the needs of the plant and possibly upon the extent to which the plant utilizes the services of the nurse. At all times the nurse works under the medical direction of a physician who may be retained as a medical consultant only or he may be engaged on a part time basis. Standing orders to guide the nurse are arranged by the physician chosen.

The objective of nursing service is to promote the physical and mental health of the employee through health teaching so that lost time from accidents or illness may be reduced. The following activity may be engaged in by the nurse:

1. Administering first aid treatment.
2. Teaching of first aid to selected employees.
3. Promoting the physical examination program and encouraging the employee in correction of defects.
4. Detecting early symptoms of disease.
5. Health education of individuals and groups of employees.
6. Allaying of fears and anxieties which may lead to accidents.
7. Assisting in the suitable placement of the employee.
8. Aiding in the rehabilitation of the injured employee.
9. Visiting ill or injured employees in the home or in the hospital.
10. Observing conditions in the plant relating to health and sanitation.

In corporations where groups of employees are scattered over a wide area, an industrial nurse can very well service the locations by making periodic visits to each one and making any necessary calls on employees who are disabled while in the vicinity. She will become acquainted with the available physicians in the community and work closely with them in an effort to secure the maximum cooperation of the employee. Many long periods of rehabilitation have been shortened and neurosis avoided by placing a workman back on a lighter job until such time as he is able to assume his regular employment.

Cooperation with community health clinics concerned with specific health programs such as tuberculosis, syphilis, cancer and heart disease can be sponsored and the company as well as the employee will benefit by participation therein. All medical and health programs directly affect the individual employee and improve the health of the entire community in which the company is located. Health teaching in the form of nutrition classes and home nursing classes can be arranged for and will create much good will among the families. It might be necessary at times to teach nursing care to some individual in the home that they may be better qualified to care for an invalid. It is said that we are a nation deficient in vitamins not because we do not have an abundance of food but because we need to know more about the proper foods and proportions of which obtain a well balanced diet. By means of group meetings, pamphlets and posters, the nurse can acquaint the wage earner with proper selection of food to maintain maximum efficiency.

Physical examinations are an essential part of any health and safety program and when they are done by a well qualified physician and the necessary correction of physical defects is done, the standard of health is greatly improved. Dental cavities and impairment of vision are the two most common defects found and unless a follow up system of determining whether or not the employee has followed the recommendation of the examining physician is established, much of the value of the program is lost. Who is better qualified to urge the employee to consult his family physician or dentist than the nurse? He will appreciate her kindly interest in him and if funds are not available for the expense involved, she may assist him in making the neces-

(*Continued on page* 168)

Program for Accounting Meetings at Cleveland

Cleveland, Ohio, May 11th and 12th

TO afford an opportunity for a general discussion of accounting problems brought on by war conditions, meetings will be held at the Cleveland Hotel, Cleveland, Ohio, on May 11th and 12th by accounting representatives of the electric and gas utilities. The meetings will be conducted by the chairmen of the several committees making up the accounting groups within the two industries and will be open to committee members and other representatives of electric and gas companies.

Utility executives and accountants are invited to attend and participate in the discussions on subjects which are of particular interest to the utility companies at this time.

The meetings will get under way at 10:00 a. m., Monday, May 11th with a General Session devoted to general presentations of the problems to be considered at later sessions. Monday afternoon the delegates will divide into two groups to begin the more specific discussion of the problems outlined in the general session.

On Tuesday morning, the conference will divide further into eight smaller groups for the more intensive consideration of specific subjects. Eight of these smaller group meetings are scheduled to consider: Customer accounting; customer relations; credits and collections; depreciation; general accounting; materials, supplies and transportation; plant accounting and records; and taxation. These meetings will begin at 9:30 a. m. and will continue throughout the morning.

At 12:30 the delegates will move to luncheon meetings where the discussion will be continued throughout the afternoon, until the subjects have been covered as thoroughly as time limits will permit.

Messrs. G. H. Bourne, The Commonwealth & Southern Corp., New York, and L. L. Dyer, Lone Star Gas Company, Dallas, Texas, are co-chairmen of the meeting and have been assisted by Messrs. F. B. Flahive, Columbia Gas & Electric Corp., New York, N. Y., and L. A. Mayo, The Connecticut Light & Power Co., Hartford, Conn., in the formulation of the program.

The program for the meeting follows:

Program

MONDAY MORNING, MAY 11th

GENERAL SESSION, 10:00 A. M.

Presiding: G. H. BOURNE, The Commonwealth & Southern Corp., New York, N. Y.
L. L. DYER, Lone Star Gas Company, Dallas, Texas
Opening Remarks
L. L. DYER
Address of Welcome
E. G. CRAWFORD, President, The Cleveland Electric Illuminating Co., Cleveland, Ohio
War Experiences of English Companies
E. N. KELLER, Philadelphia Electric Company, Philadelphia, Pa.
Safeguarding Records From Air Raids
E. H. CONARROE, Metropolitan Life Insurance Company, New York, N. Y.
Personnel Problems
J. D. DINGWELL, Washington Gas Light Company, Washington, D. C.
Closing Remarks
G. H. BOURNE

MONDAY AFTERNOON, MAY 11th

GROUP SESSIONS, 2:00 P. M.

Customer Activities Group

Presiding: H. R. FLANEGAN, Philadelphia Electric Company, Philadelphia, Pa.
G. W. FUCHS, Philadelphia Electric Company, Philadelphia, Pa.
Meeting Emergency Conditions in Customer Activities
G. W. FUCHS
Discussion—Customer Accounting Under Bimonthly and Quarterly Plans of Meter Reading and Billing; Meter Reading Problems; Billing and Bookkeeping Changes; Personnel and Cost Angles
Led by E. F. EMBREE, New Haven Gas Light Company, New Haven, Conn.
Discussion—Collections in Wartime: Changing Aspects of the Collection Program
Led by W. R. SEIDEL, Rochester Gas & Electric Corp., Rochester, N. Y.
Summary of Discussion and Concluding Remarks
E. N. KELLER, Philadelphia Electric Company, Philadelphia, Pa.

General Accounting Group

Presiding: J. W. GLENDENING, The Commonwealth & Southern Corp., New York, N. Y.
O. H. RITENOUR, Washington Gas Light Company, Washington, D. C.
Punch Cards—Stores accounting
L. E. REYNOLDS, The Connecticut Light & Power Co., Hartford, Conn.
Streamlining Reports
N. W. HAIGHT, Columbia Engineering Corp., New York, N. Y.
Overheads—What Records Should Be Maintained on Overheads? How Determined and Applied?
L. J. MARINO, The Commonwealth & Southern Corp., New York, N. Y.
Discussion—War Emergency Expenses
—Personnel Problems
Summary of Discussion and Concluding Remarks
C. E. PACKMAN, Middle West Service Corp., Chicago, Illinois

TUESDAY MORNING, MAY 12th

GROUP MEETINGS, 9:30 A. M.

Customer Activities Group

Presiding: H. R. FLANEGAN, Philadelphia Electric Company, Philadelphia, Pa.
G. W. FUCHS, Philadelphia Electric Company, Philadelphia, Pa.
Emphasizing the "Customer" in Customer Activities
H. R. FLANEGAN
Discussion—Customer Relations in the War Emergency
Led by OHMER ULLERY, Ohio Fuel Gas Company, Columbus, Ohio
Summary of Discussion and Concluding Remarks
L. A. MAYO, The Connecticut Light & Power Co., Hartford, Conn.

General Accounting Group

Presiding: J. W. GLENDENING, The Commonwealth & Southern Corp, New York, N. Y.
R. E. HULL, United Gas Pipe Line Company, Shreveport, Louisiana
Discussion—Eliminating and Condensing of Reports. Protection of Vital Records During Present Emergency
—Handling Forfeited Discounts—in earnings at date account became delinquent or at time of collection
—Office Equipment Situation—what is to be done when present equipment cannot be replaced?
—Handling of Surplus Material—are companies using the surplus materials of other companies to supply their own needs?
—Accounting for Autos

Purchasing, Stores & Transportation Group

Presiding: W. P. MCARDLE, Ebasco Services Inc., New York, N. Y.
C. H. ZUR NIEDEN, Philadelphia Electric Company, Philadelphia, Pa.
Discussion—Priorities P-46 and P-98; Reclamation and Salvage
Led by W. P. MCARDLE, Ebasco Services Inc., New York, N. Y.
—Effect of War Emergency and Priority Control on:
I Materials and Supplies
II Transportation
Restrictions in the Use of Equipment
Substitute Methods of Transportation
Transportation Expenses—clearing

Plant Accounting & Records Group

Presiding: H. B. HARDWICK, The Commonwealth & Southern Corp, New York, N. Y.
E. F. WRESSELL, Northern Indiana Public Service Co., Hammond, Ind.
Discussion—Plans and Methods for Streamlining the plant accounting records and procedures
—To what extent can plant accounting records be reduced?
—How can the investment in plant records be salvaged if records are reduced during the present emergency?
—The effect of substitute materials
—Budget and work order procedures
—Controlled standard costs

Taxation Group

Presiding: R. M. CAMPBELL, Standard Oil Company of New Jersey, New York, N. Y.
Discussion—The War Tax Program
—The Accountant and Increasing Taxes

TUESDAY AFTERNOON, MAY 12th

LUNCHEON MEETINGS, 12:30 to 4 P. M.

Secure Your Luncheon Tickets When You Register . . . Price $1.50

Customer Activities Group
Customer Accounting
Customer Relations
Credits and Collections
General Activities Group
General Accounting
Depreciation
Purchasing, Stores & Transportation
Plant Accounting & Records
Taxation

Joint Meeting of Engineering Committees

Chicago, May 4th. 5th and 6th

THE customary grouped Spring meetings of the Engineering Committees of the Edison Electric Institute will be held on May 4, 5 and 6, at the Edgewater Beach Hotel in Chicago. In conformity with the times, the general program will be shortened and condensed wherever possible. The Hydraulic Power Committee will not meet on this occasion principally because certain work in progress will not be completed in time for consideration by the members, and the Meter and Service Committee will not be represented because prior commitments required a meeting elsewhere only two weeks earlier.

The programs of the several committees are, if anything, more crowded than usual, with urgent operating matters and situations arising out of the state of war. They will be well pressed to complete their programs within the allotted time for sessions, and this consideration alone would be sufficient to curtail any additional activities.

The only event scheduled of a general nature is a joint luncheon on Tuesday, May 5, without formal speakers, where it is contemplated that a rapid review of outstanding engineering activities will be provided by the chairmen of the committees.

Program

ACCIDENT PREVENTION COMMITTEE

GEORGE S. DIEHL, Chairman

May 5 — 9:30 a.m. — Berwyn Room

Round Table Discussion

May 5 — 2:00 p.m. — East Lounge

Joint Session—Accident Prevention Committee, EEI, with Executive Committee of the Public Utility Section of the National Safety Council

Discussion:
- Simplification of the Collection of Accident Statistics for the Electric Industry
- A.S.A. Code for the Compilation of Accident Causes in the Electric Industry
- Should Accidents Which Occur During an Actual Air Raid Be Counted Against the Operating Company?

May 6 — 9:00 a.m. — Berwyn Room

Report of the Statistics Committee
E. H. KREH, Duquesne Light Co., Pittsburgh, Pa.
Report on Merit Award Certificate
Report on the Rubber Protective Equipment Investigation
ROY M. GODWIN, Philadelphia Electric Co., Philadelphia, Pa.
Report by Transmission and Distribution Committee Liaison Representative
H. O. SPRINKLE, Monongahela West Penn Public Service Co., Fairmount, W. Va.
Report on Linemen's Handbook
H. O. SPRINKLE, Monongahela West Penn Public Service Co., Fairmount, W. Va.
Report on Low Voltage Hazards
C. B. BOULET, Wisconsin Public Service Co., Milwaukee, Wis.

May 6 — 1:30 p.m. — Berwyn Room

Report on Public Safety
A. A. RALL, Kansas City Power & Light Co., Kansas City, Mo.
Discussion — Warm Weather and Electric Shock Hazards
W. R. SMITH and D. C. STEWART, Public Service Electric & Gas Co., Newark, N. J., and Buffalo, Niagara & Eastern Power Corp., Buffalo, N. Y.
Report on Resuscitation
W. R. SMITH, Public Service Electric & Gas Co., Newark, N. J.
Progress Report on Street and Highway Protective Measures
H. F. WEBB, West Penn Power Co., Pittsburgh, Pa.

TRANSMISSION AND DISTRIBUTION COMMITTEE

E. V. SAYLES, Chairman

Attendance Limited to Committee Members, Representatives of Light and Power Utility Companies and Invited Guests

May 4 — 9:45 a.m. — Michigan Room

Underground Group

T. G. HIERONYMUS, Chairman

Increased Cable Rating for War Industry Loads — II
E. W. OESTERREICH, Duquesne Light Company, Pittsburgh, Pa.
Cable Operation Report
A. B. CAMPBELL, Edison Electric Institute, New York City
Low Voltage A-C Network Report
A. BODICKY, Union Electric Co. of Missouri, St. Louis, Mo.
A Discussion of 73 Kv Oil-Filled Cable Installation in Kansas City (with colored movies)
T. G. HIERONYMUS, Kansas City Power & Light Co., Kansas City, Mo.
General Discussion of Underground Systems

May 4 — 2:00 p.m. — Michigan Room

Current Problems With Respect to Priorities
WALKER L. CISLER, Power Branch — War Production Board, Washington, D. C.

May 5 — 9:30 a.m. — Michigan Room

Overhead Distribution Group
G. H. FIEDLER, Chairman

Use of Steel Wire for Overhead Line Extensions
T. F. PETERSON, American Steel and Wire Company
Effect of Bombing on Shanghai Power System
W. HUNTER, formerly with Shanghai Power Company
Round Table Discussion
F. E. SANFORD, Presiding, Cincinnati Gas and Electric Co., Cincinnati, Ohio. (Attendance limited to members and representatives of power companies.)
Possible Utilization of Existing Material by Relocation on the System
Increased Equipment Allowable Load Bases
Organization for Emergency Protection and Repair
Protection of Customers' Service Installations
Other Discussions of Current Problems

May 5 — 2:00 p.m. — Michigan Room

Joint Session — Electrical Equipment Committee and Transmission and Distribution Committee.

(See Electrical Equipment Committee Program for this session.)

ELECTRICAL EQUIPMENT COMMITTEE

R. W. WILBRAHAM, Chairman

May 4 — 9:30 a.m. — East Lounge

Closed session (attendance limited to members, and guests sponsored by members or the chairman)

Operating and Maintenance Division
H. S. FITCH, Presiding

Protection of Electric Utility Systems Against Air Raids
A. V. DEBEECH, Canadian & General Finance Co., Toronto, Ont., Canada
Effect of Bombing on Shanghai Power System
W. HUNTER, formerly with Shanghai Power Company
Effect of Rifle Fire on Transformer Tanks and Masonry Walls
E. H. SNYDER, Public Service Electric & Gas Co., Newark, N. J.
Round Table Discussion of Blackouts, Sabotage and Air Raid Protection Measures

System Engineering Division
H. A. DRYAR, Presiding

Capacity Definitions
S. STOKES, Union Electric Co. of Missouri, St. Louis, Missouri

May 4 — 2:00 p.m. — East Lounge

Closed session (attendance limited to members, and guests sponsored by members or the chairman)

System Engineering Division

Curtailment of Load and Rerating of Equipment
PHILIP SPORN, American Gas and Electric Service Corp., New York City
Effect of War Time on System Peak Load
H. A. DRYAR, Philadelphia Electric Company, Philadelphia, Pa.

Apparatus and Design Division
B. VAN NESS, JR., Presiding

Apparatus Troubles
F. S. BROWN, Duquesne Light Co., Pittsburgh, Pa.
Joint Committee — Oil Circuit Breaker Reports
R. T. HENRY, Buffalo, Niagara & Eastern Power Corp, Buffalo, N. Y.
Difficulties with Shaft Couplings
F. A. LANE, American Gas & Electric Service Corp., New York City
Revision of Rotating Machinery Standard ASA C50
H. E. KENT, Edison Electric Institute, New York City

May 5 — 9:00 a.m. — East Lounge

OPEN SESSION

Apparatus and Design Division
B. VAN NESS, JR., Presiding

Station Design as Affected by War Conditions and Material Limitations
H. B. WOOD, Stone & Webster Engineering Corp., Boston, Mass.
New Developments in Rotating Machinery Design
L. BIRCKHEAD, Consolidated Gas, Electric Light and Power Co., Baltimore, Md.

Meter and Service Division
A. E. SILVER, Presiding

Report of Meter and Service Committee
F. E. DAVIS, Commonwealth and Southern Corp., Jackson, Mich.
Progress Report — Standardization of Bar-Type Current Transformer
Progress Report — Service Drop Cable Simplifications
Submission for Confirmatory Vite — Specifications for Wound Type Current Transformers
Submission for Confirmatory Vote — Specifications for Demand Register Scales

May 5 — 2:00 p.m. — Michigan Room

Joint Session with the Transmission and Distribution Committee
Engineering Aspects of the Single Phase Motor Starting Current Problem
B. C. SHERWOOD, Chairman, AEIC and EEI representatives on Joint Committee.
Joint Report on Utilization Voltages
J. H. FOOTE, Chairman, Utilization Division, Electrical Equipment Committee
Coordination of Distribution and Power Supply System Voltages
C. E. ARVIDSON, Commonwealth & Southern Corp., Jackson, Mich.
Proposed ASA Preferred Wire Sizes
F. E. SANFORD, Cincinnati Gas & Electric Co., Cincinnati, Ohio

PRIME MOVERS COMMITTEE

J. A. KEETH, Chairman

May 4 — 10:00 a.m. — West Room
May 5 — 9:30 a.m. — West Room

In order to allow a maximum of time for the Round Table Discussion, the preliminary reports of the standing subcommittees will be very much curtailed. It is hoped that all of the Round Table subjects carried over from the February meeting, as well as new subjects offered, can be completed Monday. *This will permit devoting all of Tuesday morning to the important subject of "Furnace Wall Tube Corrosion."*

LUNCHEON MEETING OF ALL COMMITTEES

May 5 — 12:30 p.m. — Ballroom

The committee chairmen will briefly discuss the outstanding problems in their respective fields.

Survey of Various Classes of Insurance

(*Continued from page* 161)

erty by striking employees, civil commotion, explosion originating on or off the premises of the assured excepting explosion originating in steam boilers, engines, and machinery, but excluding loss caused directly or indirectly by bombardment, war, insurrection or invasion, whether war is actually declared or not. The riot and civil commotion policy does not cover loss caused by a strike unless such loss is the result of mob violence or of a riot growing out of the strike or unless the strikers occupy the premises. It does not cover acts of malicious mischief or vandalism, or loss due to malicious intent of any kind, other than during riot, civil commotion or sit-down strikes.

Riot and Civil Commotion Including Malicious Mischief and Vandalism

The coverage under this form of insurance is the same as for the preceding item except that there is attached an endorsement extending the coverage to include vandalism and malicious mischief, meaning the willful or malicious physical injury to or destruction of the insured property. It should be noted that while the term "sabotage" is often used in connection with the vandalism and malicious mischief endorsement, strictly speaking sabotage may include some acts not covered by the malicious damage form.

Alex Dow

ALEX DOW died of pneumonia at Detroit on March 22, after an illness of less than a week. The dominant personality in Detroit's electric light and power industry for the last 49 years and for nearly as long an outstanding national figure, Mr. Dow easily ranked among the greatest of the industry's master-builders.

Born in Glasgow, Scotland, April 12, 1862, his formal education was limited to six years at a Presbyterian parish school, circumstances forcing him to go to work at the age of 11. For six years he was messenger boy, then junior clerk and stenographer in a railroad office. At 17, he found employment with the Cunard Steamship Line in Liverpool. His clerical duties there often caused him to be afloat, and he spent all his spare time in the steamships' engine rooms.

In November, 1882, Mr. Dow came to the United States. His first job here was with the Baltimore and Ohio Railroad. Next he studied electricity as a supervisor of local line and instrument maintenance for the Baltimore and Ohio Telegraph Company. In October, 1888, he was employed by the Brush Electric Company of Cleveland, his first assignment with the Brush Company was as installing electrician of the Chicago office. A year later he became District Engineer and was responsible for the design and construction in 1892 of the lighting of the South Park system of Chicago, which required 30 miles of underground cable.

In 1893 the City of Detroit engaged him as Municipal Engineer and while in this position he designed and built a lighting plant for the city. In 1896 he resigned to become vice-president and general manager of The Edison Illuminating Company of Detroit.

When The Detroit Edison Company was formed in 1903, Mr. Dow continued as vice-president and general manager. In 1912 he became President and held that position for 28 years. During those years his insistence upon furnishing reliable electric service at fair rates played a major part in the growth of Detroit.

In 1940 Mr. Dow resigned the presidency of The Detroit Edison Company, becoming Chairman of the Executive Committee. He continued until his death to serve as District Chief of Ordnance, U. S. Army, a post he had accepted in 1932.

The City of Detroit twice called Mr. Dow back to service. From 1916 to 1921 he served as engineer member of the Board of Water Commissioners; from 1925 to 1932 he was President of the Board. In both instances, he protected the department from politics, introducing the sound business procedures which he had always observed.

Many utility practices common today were pioneered by Mr. Dow. He planned the distant-controlled rotary converter, first step in the development of automatic substations; in 1898 recognized the practicability of the Wright demand meter, in use 40 years; built generating plants near the load centers, with high voltage distribution to substations; installed at Conners Creek the first of the large horizontal turbo-generators later to become standard throughout the country.

Although Mr. Dow was a graduate of no university or technical school, he held honorary degrees in engineering, science, and the arts from the University of Michigan, University of Detroit and Wayne University.

He was active for many years in the work of the National Electric Light Association and the Edison Electric Institute. As member and chairman of the Rate Committee of the National Electric Light Association, he was a strong influence in the development of electric rate forms and schedules. He was an early exponent of the demand type of rate now generally accepted as most logical and fair.

His professional affiliations were many: American Society of Mechanical Engineers, American Society of Civil Engineers, American Institute of Electrical Engineers, the Institution of Electrical Engineers (Great Britain), The Institution of Mechanical Engineers (Great Britain). He was awarded the Edison Medal for 1936 by the A.I.E.E. He was honorary charter member of the Engineering Society of Detroit, and since 1936 had been president of the Trustees, Rackham Engineering Foundation.

Surviving him are his wife, the former Vivienne Kinnersley; their four children, Mrs. James W. Parker, Mrs. Lawrence H. Connell, Col. Douglas Dow, and Lothrop Dow, and eight grandchildren.

Marion Penn

MARION PENN, general manager of the Electric Department of the Public Service Electric and Gas Company, and a director of the subsidiary companies of the Public Service Corporation of New Jersey, died March 29 at his home in South Orange, N. J., of a cerebral hemorrhage. Although he had had a heart ailment for several years, Mr. Penn had been able to continue actively his work in the company's electric department and was in his office up to March 26. He was born May 5, 1890, at Humboldt, Tenn.

Mr. Penn had been in the electric utility field since his graduation from Purdue University in 1911 with a degree of B.S. in electrical engineering. His first job was with the General Electric Company in Schenectady, N. Y. He joined Public Service in 1914, where his first assignment was as assistant division superintendent of the Central Division, at Elizabeth. In 1919 he was assigned to the company's general office in Newark as plant engineer. A year later he was made superintendent of the company's Essex Generating Station in Newark, and subsequently, was superintendent, respectively, of the Marion and Kearny generating stations until 1926 when he was promoted to general superintendent of generation. He was named general manager of the Electric Department in 1935.

A national figure in the electric utility industry, Mr. Penn was very active in the affairs of the Edison Electric Institute. He was a fellow of the American Institute of Electrical Engineers, and a member of the American Society of Mechanical Engineers. He worked closely with governmental agencies relative to the electric utility's part in the war effort.

Mr. Penn was a member of the Ford Peace Expedition in 1916. Back from that unsuccessful attempt to bring about a cessation of hostilities in a war-torn Europe, Mr. Penn returned to his work in Public Service. A month after the United States entered the World War I, Mr. Penn enlisted, in May, 1917, in the United States Army. He was at the first Officer's Training Camp at Fort Myer, Va., where he was commissioned a captain in the heavy artillery. He went overseas with the Forty-Sixth Regiment, Coast Artillery Corps.

PERSONALS

CHARLES M. COHN, executive vice-president of the Consolidated Gas, Electric Light and Power Co. of Baltimore, was elected president of the company at a recent meeting of the board of directors to succeed HERBERT A. WAGNER, who has been president since 1915. Mr. Wagner will continue as chairman of the board, a position he assumed in 1939 in addition to the presidency.

WILLIAM SCHMIDT, JR., a vice-president of the company was made executive vice-president to succeed Mr. Cohn. RALPH L. THOMAS, executive engineer, was elected a vice-president and J. T. WOLFE was elected assistant vice-president.

Mr. Cohn has spent his entire business career with the company. He has been successively secretary, vice-president, executive vice-president—to which position he was elected in 1931—and president. Mr. Cohn has long been a member of the utility's board of directors and of its executive committee.

Mr. Schmidt was made a vice-president of the company in 1938. He has been a director of the company since 1914 and a member of the executive committee since 1933. He has had long experience in the financial affairs of the company. Before being elected vice-president he has served as auditor, secretary and treasurer.

Mr. Thomas had been executive engineer of the company since 1938 and has been a director since 1939. He was general superintendent of Pennsylvania Water and Power Co. from 1915 to 1938 and has been project engineer of the Safe Harbor Water Power Corp. since 1930. He was graduated from Princeton and later from Massachusetts Institute of Technology in electrical engineering.

ADDISON W. LEE, JR., vice-president in charge of operations of the Louisville Gas and Electric Co., Louisville, Ky., recently celebrated his thirty-fifth year of continuous service with the company. In honor of the occasion T. B. Wilson, president of the company, presented to him a gold service button. Mr. Lee joined the company following his graduation from Rose Polytechnic Institute, Terre Haute, Ind.

JOHN B. POSTON was elected president of the Columbus & Southern Ohio Electric Co. at the annual meeting of the board of directors. He succeeds B. W. MARR, who had been president of the company since 1929 and now continues as chairman of the board.

Mr. Poston received his education at the University of California. His first employment in the public utility field was in 1914 with the Hocking Power Co., founded by his father, which was a predecessor company of the Southern Ohio Electric Co., later merged with the Columbus Railway, Power and Light Co. to form the present company.

After serving several years as general manager of the Southern Ohio Electric Co., he was elected president in 1934. In 1931 he became a director of the Columbus Railway, Power and Light Co. and was made its executive vice-president in 1932, continuing in that capacity after the two companies were merged in 1937 into the Columbus & Southern Ohio Electric Co.

ERWIN H. WILL has been elected president of the El Paso Electric Co., to succeed ROY S. NELSON, now head of Gulf States Utilities Co. Mr. Will became identified with the El Paso properties in 1935. Early that year he was appointed general lighting superintendent and three years later was promoted to the position of general superintendent of the lighting and transportation departments, the position he occupied at the time of his recent promotion.

Mr. Will's early experience was obtained with the Virginia Railway and Power Co., predecessor of Virginia Electric and Power Co. Starting in the engineering department in Richmond, Va., he was made chief draftsman and transferred to Norfolk and upon the formation of the Virginia Electric and Power Company, he remained in Norfolk first as assistant superintendent of the electric department and then as assistant to vice-president. Then he went to Suffolk as superintendent, district manager and assistant to general manager, returning to Richmond as industrial sales manager.

GLENN C. KILEY has been elected vice-president of the Oklahoma Gas and Electric Company. Mr. Kiley has been manager of the company's Western division with headquarters in Oklahoma City since 1933.

E. F. GRAHAM, rate engineer and member of the board of directors of Southwestern Gas and Electric Company, has been appointed to the position of assistant to the president, FRANK M. WILKES.

Mr. Graham's association with the electric industry goes back to his graduation from North Carolina State College when he went to Lynn, Mass., with the General Electric Company on their test course. From there he went to Marshall, Texas, as assistant to the chief engineer and later became assistant to the general manager.

In 1927 he went to Texarkana as assistant to the executive vice-president of Southwestern Gas and Electric Company. He came to Shreveport in 1928 and later that same year went to Dallas as assistant to the chief engineer of the Central and Southwest Utilities Company. In 1932 he returned to Shreveport as rate engineer and later became head of the rate department of Southwestern Gas and Electric Company.

The promotion of FRANK M. WARREN, JR., to the position of second vice-president of Portland General Electric Company has been announced by James H. Polhemus, president and general manager.

Mr. Warren formerly was assistant to the president. After graduating from the Stanford School of Enginnering and the Harvard School of Business Administration, Mr. Warren joined the Portland General Electric Company in 1937 as statistician, and later became assistant to the general division manager.

C. F. MOULTON, assistant operating engineer of the Nebraska Power Co. for more than ten years and employed at the power station nearly 16 years, has been promoted to operating engineer, with supervision of operating employees in the turbine, boiler and switchboard rooms. ROBERT R. BRIGGS will add supervision of plant efficiency and betterment work to his duties as chief chemist. Mr. Briggs' new title is plant efficiency engineer. He has been at the power station nearly 21 years, starting in the turbine room.

ROBERT F. PROBST of Hartford, an employee of The Connecticut Light and Power Company for 19 years, was elected assistant secretary of the Company at a meeting of the board of directors in Hartford, April 15. He will succeed Ray K. Linsley of Bristol, assistant secretary since 1932. Mr. Linsley plans to retire on August 1, after 43 years in the public utility field.

Value of Industrial Nursing Services

(*Continued from page* 162)

sary loan through the Credit Union or the Employees Benefit Association. Complaints of unhealthy working conditions may come to the nurse which, when referred to the proper department by her, will improve health conditions and assure the employee that he did not seek her counsel in vain.

In visiting the injured employee, the nurse is sometimes the only company representative who calls on him for all too often this is an important duty which is overlooked. Perhaps it is the suffering man's first experience in a hospital and he is apprehensive about his condition. He may be worried about expenses incurred and if at this time the nurse will explain the company's responsibility and interest in him it will relieve his mind immensely and hasten his recovery. Confidence of a patient in his physician is an important factor and the nurse may not only assist in the selection of a well qualified physician but will aid in building confidence in the physician chosen. If the patient has been injured in an isolated area of the country it may be necessary to call in a consultant or arrange to have him transferred to a medical center with available facilities for treatment. These matters may be referred to the medical director retained by the corporation. After an injury there may be need of a series of physio-therapy and occupational therapy treatments to restore function to the injured member, thereby greatly reducing the permanent disability. A well informed nurse can, under the physician's instructions, arrange for this form of treatment.

Dermatitis or skin irritation is responsible for an estimated 65 per cent of all compensable occupational disease in the United States. This problem alone is one in which the nurse can aid management in reducing costs by investigating the type of irritant which the employee is coming in contact with, and eliminating the substance as much as possible. If it is a chemical irritant to which the employee is particularly sensitive, a substitute may be found, or protective clothing such as gloves or protective ointments may be indicated. Poison weeds are a common source of trouble and each year many people suffer discomfort and disability because of contact with poison ivy or oak. Dr. Louis Schwartz of U. S. Public Health Service reports that an effective protective cream may be made of a 10 per cent sodium perborate in vanishing cream and applied to the exposed skin before beginning work and again at noon, taking care to wash the skin well before re-applying the protective cream. Personal hygiene plays an important part in the eradication of all skin irritations.

Courses in American Red Cross first aid should be held in attendance stimulated for many an injury is complicated by mishandling in transportation. The fundamentals of emergency first aid should be taught to as many individuals in each organization as possible. Insofar as the health and safety of the worker is a definite factor in his satisfactory adjustment to his job, nursing in industry is closely allied to the general program of industrial relations. Thus the well qualified industrial nurse becomes a factor in increasing production through promoting harmony and inspiring loyalty.

CONVENTIONS AND MEETINGS

1942

APRIL

9-10	Midwest Power Conference, Palmer House, Chicago, Ill.
14-15	Missouri Association of Public Utilities, Jefferson Hotel, St. Louis, Mo.
16-17	Southeastern Electric Exchange, Annual Conference, Edgewater Gulf Hotel, Edgewater Park, Miss.
24	Maryland Utilities Association, Lord Baltimore Hotel, Baltimore, Md.
23-24	Northwest Electric Light and Power Association, Engineering and Operating Section, Olympic Hotel, Seattle, Wash.
27-30	Chamber of Commerce of the U. S. A., Chicago, Ill.

MAY

4-5	Electrical Equipment Committee, EEI, Edgewater Beach Hotel, Chicago, Ill.
4-5	Prime Movers Committee, EEI, Edgewater Beach Hotel, Chicago, Ill.
4-5	Transmission and Distribution Committee, EEI, Edgewater Beach Hotel, Chicago, Ill.
5-6	Accident Prevention Committee, EEI, Edgewater Beach Hotel, Chicago, Ill.
6-8	Electrical Manufacturers Club, The Homestead, Hot Springs, Va.
10-15	National Retail Credit Men's Association, Cincinnati, Ohio.
10-15	National Electrical Manufacturers Association, The Homestead, Hot Springs, Va.
11-12	Accounting Meeting of Gas and Electric Utilities, Hotel Cleveland, Cleveland, Ohio.
11-15	National Fire Protection Association, Atlantic City, N. J.
17-21	National Electrical Wholesalers Association, The Homestead, Hot Springs, Va.
18-19	Arkansas Utilities Association, Arlington Hotel, Hot Springs National Park, Ark.
21-22	Missouri Valley Electric Association, Hotel Continental, Kansas City, Mo.
21-22	Pacific Coast Electrical Association, Annual Convention, Fairmont Hotel, San Francisco, Calif.
22-26	Westinghouse Agent-Jobbers Association, The Homestead, Hot Springs, Va.
25-28	National Association of Purchasing Agents, New York, N. Y.

JUNE

8-10	American Society of Mechanical Engineers, Hotel Statler, Cleveland, Ohio.
10-12	Canadian Electrical Association, Log Chateau, Seigniory Club, Que.
11-12	National District Heating Association, semi-annual meeting, The Dayton Biltmore Hotel, Dayton, Ohio.
15-17	American Society of Heating and Ventilating Engineers, semi-annual meeting, St. Paul Hotel, St. Paul, Minn.
21-24	Public Utilities Advertising Association, Hotel Commodore, New York, N. Y.
22-26	American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, N. J.

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